

RISK PERCEPTION OF WORK-RELATED INFECTIONS AMONG DENTAL STUDENTS IN IASI, ROMANIA

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Abstract

Dental practitioners are at a high risk of occupational infections, but some of them do not comply with infection control practices very well. The **aim** of the present study was to assess the risk perception of work-related infections and the corresponding preventive measures among dental students in Iasi, Romania. **Material and methods**: Cross-sectional, questionnaire-based study included 90 subjects aged 22-28 years, attending years 4th, 5th and 6th of the Faculty of Dental Medicine within the “Grigore T. Popa” University of Medicine and Pharmacy in Iasi. **Results**: Wearing of personal protective equipment was reported by a percentage between 20% and 88% of the students. Half of the investigated students reported that they always perform hand hygiene after dental procedures. The potential risk of transmission of blood-borne pathogens in the dental office was correctly estimated by 23% of students for HBV, 26% for HCV, and 33% for HIV. A percentage of 73% of study participants declared that they received full HBV vaccine, and 60% of students were not sure about what they must do in case of an accident with exposure to blood. **Conclusion**: The results of the study suggest the need for continuous information and a better awareness of young practitioners on work-related infections and preventive measures in dentistry.

Keywords: RISK PERCEPTION, WORK-RELATED INFECTIONS, PREVENTIVE MEASURES, DENTAL STUDENTS.

INTRODUCTION

Dental health care workers (DHCW) are at a high risk of cross-infection through occupational exposure, such as needlestick and sharp instrument injuries, mucocutaneous contamination, bites, conjunctivitis and mechanical trauma [1-4]. Serious hazards for DHCW are represented by various microorganisms, e.g., cytomegalovirus, Mycobacterium tuberculosis, hepatitis B and hepatitis C viruses (HBV and HCV), human immunodeficiency virus (HIV), streptococci, and severe acute respiratory syndrome (SARS) virus transmitted through direct and indirect contact [5].

Many infections are subclinical and almost 80% of all HBV infections are undiagnosed. Therefore, DHCW are at risk every day [6]. The danger is enhanced by the fact that some hazardous microorganisms remain in the air for up to 30 minutes after the dental treatment, and the fact that most human microbial pathogens have been isolated from oral secretions [7, 8].

Routine infection control procedures and recommendations have been available since the 1970s but were neglected and ignored even by highly educated groups. In 1996, the US Centers for Disease Control

and Prevention (CDC) adopted the term “standard precautions” to generate broader understanding and awareness of prevention and transmission of infection. In 2003, the CDC published “Guidelines for Infection Control in Dental Health-Care Settings”, which included standard precautions to ensure safe working environments and prevent cross-infection among DHCW and their patients [9], and in 2016 the CDC published “Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care”, updated in 2023 [10].

Despite the emphasis that was placed on making DHCW aware of the risk of cross-infection and the recommended practices to control infection transmission, the percentage of DHCW who adhered to those practices was below expectations [11, 12].

Even at dental schools, dental students do not comply with infection control practices very well [13]. Because dental students have increasing patient contact during their education and clinical years, they are at massive risk of cross-infection [14, 15]. Therefore, the assessment of their risk perception on work-related infections and compliance with preventive measures is required as a continuous necessity.

The aim of the present research was to assess the risk perception of work-related infections and the corresponding preventive measures among dental students in Iasi, Romania.

MATERIAL AND METHODS

The study was questionnaire-based, cross-sectional in design. It included a group of 90 subjects, randomly selected, students in the 4th, 5th and 6th years of training at the Faculty of Dental Medicine

within the "Grigore T. Popa" University of Medicine and Pharmacy from Iasi. All subjects who agreed to participate (by completing the questionnaire) were included in the study. The questionnaires were anonymous, thus ensuring the impossible identification of the subjects after processing the answers. Subjects who did not consent to participate and questionnaires with incomplete answers were excluded. Questionnaires were returned immediately after completion.

The questionnaire was original, self-administered, and contained 16 closed, single- or multiple- choice questions, based on the data from the literature regarding work-related infections in the dental office and their prevention guidelines. A pilot study was conducted on 15 subjects to establish the practical relevance and correct understanding of the questions. The responses obtained in the pilot study were not considered in the analysis of the final results. The Cronbach alpha coefficient of the questionnaire was 0.82. Where appropriate, some of the questions were reformulated. After the pilot study, a required time of 20 minutes was established.

The first part of the questionnaire contained 3 questions related to subjects' age, year of study and gender. The following questions related to the use of personal protective equipment (gloves, mask, eye protection), as well as hand hygiene in relation to dental procedures. The third section referred to the attitude concerning the patient's general health status as an infectious risk factor, the knowledge about the risk of transmission of the main blood-borne diseases in the dental office, and protection by vaccination against hepatitis B. The final section in the

questionnaire concerned sharps disposal, as well as knowledge of post-exposure protocol (PEP) to blood.

The data were statistically analyzed using SPSS (Statistical Package for Social Sciences) 21.0. The results were analyzed descriptively, using frequencies and percentages. To compare the results by gender of the subjects or year of study, the chi-square test was used, and the correlation analysis was done using the Spearman coefficient. The p value of the statistical significance cutoff point was set at 0.05, for a 95% confidence interval.

RESULTS

An initial number of 100 subjects were included in the study, with an average age of 24.8 (± 2.5) years. The response rate for the questionnaire was 90.00%, as a number of 10 questionnaires did not have complete answers, leading to a final number of 90 questionnaires, of which 47 (52.22%) were male, and 43 (47.77%) were female. The distribution by year of study was as follows: 44 subjects (48.88%) from 4th year, 22 subjects (24.44%) from 5th year, and 24 subjects (26.66%) from 6th year.

The distribution of answers to the questions concerning the wear of personal protective equipment and hand hygiene is presented in Table I. Most of the subjects in the study sample (88.33%) stated that they wear protective gloves for all patients, regardless of the procedure, 8.33% answered that they wear gloves only during certain procedures, and 3.33% - only if the patient has an infectious disease. The answer "No, I usually don't" was not selected by any of the investigated students. Comparative assessment by gender showed a slightly higher rate of wearing gloves

among female subjects than among male subjects, but differences were not significant ($p=0.120$). Comparative analysis by year of study indicated an increase of the rates of wearing gloves with increasing year of study ($p=0.004$, $r=0.412$).

Question 5 assessed the rate of wearing protective face masks by students during the dental procedures, with multiple choice responses. Most of the respondents (78.26%) stated that they always wear protective mask during their clinical activity, 13.04% wear a face mask only during seasonal epidemics of respiratory virosis, 17.40% said they wear a face mask only if the patient has clinical signs of respiratory virosis, and 15.21% declared that they wear a face mask only during procedures that involve aerosols release. The answer "No, I usually don't" was not selected by any of the participants. Female students had a higher rate of wearing protective face mask than male students ($p=0.040$, $r=0.308$), and the percentage of subjects who reported wearing a face mask during all dental procedures was higher among 6th year students than among 5th and 4th year students ($p=0.032$, $r=0.353$).

The highest percentage of the investigated students reported changing the face mask after each patient (70.00%). However, the remaining 30.00% answered that they change face mask at the end of the working day. The answer option "Every 3 patients" was not selected by any participant. Comparative analysis of the answers by gender and year of study showed statistically significant differences ($p<0.05$) and a direct moderate correlation ($r = 0.218$ and $r = 0.366$, respectively), with a higher frequency of changing face mask in female subjects and in students attending the final years of study.

When asked about the eye protection (goggles or visor) they wear during clinical activity, most of the investigated subjects (46.67%) declared that they only wear it during certain procedures, one third (33.33%) do not usually wear it while working, and only 20.00% of them declared that they always wear it during their clinical activity. Significant differences were found by gender ($p=0.009$), and a direct strong correlation between the use of eye protection and gender ($r=0.416$), with female subjects wearing more frequently eye protection while working. Important differences ($p=0.006$) were also found by

year of study, and a direct strong correlation ($r=0.605$).

Half of the investigated students (50.00%) reported that they perform hand hygiene after dental procedures, while 30.00% of them considered that hand hygiene after clinical procedures is only necessary if they did not wear gloves. A percentage of 10.00% applied hand hygiene only after treating patients with infectious diseases, and another 10.00% did not usually wash their hands after dental procedures. Hand hygiene after dental procedures was reported more frequently by female subjects ($p=0.031$, $r=0.206$) and final year students ($p=0.005$, $r=0.520$).

Table I. Frequency of answers concerning personal protective equipment and hand hygiene

| Question | Total (%) | % by gender | | % by year of study | | |
|---|-----------|-------------|--------|--------------------|-------|--------|
| | | Male | Female | 4th | 5th | 6th |
| 4. Do you wear protective gloves during clinical activity? | | | | | | |
| a). Yes, I always do | 88.33 | 87.50 | 89.28 | 79.31 | 93.33 | 100.00 |
| b). Only during certain procedures | 8.33 | 9.37 | 7.14 | 13.80 | 6.66 | 0.00 |
| c). Only if the patient has an infectious disease | 3.33 | 3.12 | 3.57 | 6.89 | 0.00 | 0.00 |
| d). No, I usually don't | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| <i>Sig (p)</i> | | 0.120 | | 0.004* | | |
| <i>Correl (r)</i> | | - | | 0.412 | | |
| 5. Do you wear a face mask during dental procedures? | | | | | | |
| a). Yes, I always do | 78.26 | 75.00 | 83.33 | 73.33 | 81.04 | 87.50 |
| b). Only during seasonal epidemics of respiratory virosis | 13.04 | 14.28 | 11.11 | 16.66 | 11.28 | 6.25 |
| c). Only if the patient has clinical signs of respiratory virosis | 17.40 | 17.85 | 16.66 | 20.00 | 17.26 | 12.50 |
| d). Only during procedures that involve aerosols release | 15.21 | 17.85 | 11.11 | 16.66 | 14.21 | 12.50 |
| e). No, I usually don't | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| <i>Sig (p)</i> | | 0.040* | | 0.032* | | |
| <i>Correl (r)</i> | | 0.308 | | 0.353 | | |
| 6. How often do you change your face mask? | | | | | | |
| a). After each patient | 70.00 | 62.50 | 78.57 | 62.06 | 73.33 | 81.25 |
| b). Every 3 patients | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| c). At the end of the working day | 30.00 | 37.50 | 21.43 | 37.93 | 26.66 | 18.75 |

| | | | | | | | |
|--|-------|-------------------------------|-------|-------|-------------------------------|-------|--|
| <i>Sig (p)</i> <i>Correl (r)</i> | | <i>0.041*</i> <i>0.218</i> | | | <i>0.018*</i> <i>0.366</i> | | |
| 7. Do you use goggles/visor to protect your eyes during dental procedures? | | | | | | | |
| a). Yes, I always do | 20.00 | 18.75 | 21.42 | 13.79 | 20.00 | 31.25 | |
| b). Only during certain procedures | 46.67 | 37.50 | 57.14 | 44.82 | 46.66 | 50.00 | |
| c). No, I usually don't | 33.33 | 43.75 | 21.42 | 41.38 | 33.33 | 18.75 | |
| <i>Sig (p)</i> <i>Correl (r)</i> | | <i>0.009*</i> <i>0.416</i> | | | <i>0.006*</i> <i>0.605</i> | | |
| 8. Do you wash your hands after dental procedures? | | | | | | | |
| a). Yes, I always do | 50.00 | 43.75 | 57.14 | 34.48 | 60.00 | 68.75 | |
| b). Yes, but only if I didn't wear gloves | 30.00 | 31.25 | 28.57 | 31.03 | 33.33 | 25.00 | |
| c). Yes, but only in the case of patients with infectious diseases | 10.00 | 12.50 | 7.14 | 13.79 | 6.67 | 6.25 | |
| d). No, I usually don't | 10.00 | 12.50 | 7.14 | 20.69 | 0.00 | 0.00 | |
| <i>Sig (p)</i> <i>Correl (r)</i> | | <i>0.031*</i> <i>0.206</i> | | | <i>0.005*</i> <i>0.520</i> | | |

*Statistical significance ($p < 0.05$)

The frequency of answers to questions 9-14, concerning the attitude towards the patient's infectious status and the knowledge about the risk of main blood-borne pathogens transmission in the dental office is presented in Table II. Taking full medical history of the patient was reported with variable frequency by the students in the study sample: most of them (41.67%) declared that they sometimes investigate patient's full medical anamnesis, one third (33.33%) stated that they always do that, and 25.00% reported that they do not usually do that. Significant differences ($p = 0.002$) were found by year of study, and correlation analysis indicated a direct strong association ($r = 0.702$) between the two variables: the frequency of taking full medical history of the patient increases with increasing year of study.

Assessment of the attitude towards patients with clinical signs of acute respiratory diseases indicated that half of

the students in the research sample (50.00%) declared that they would provide all the necessary treatments, 30.00% answered correctly (provide emergency treatments only), and 20.00% considered that no kind of treatment should be provided to such patients. Comparative analysis by year of study revealed that students of the final years tend to have a more reserved attitude towards treating patients with respiratory diseases ($p = 0.016$): an inverse moderate correlation was found between the frequency of providing treatments to patients with acute respiratory diseases and participants' year of study ($r = -0.374$).

The answers selected to the question referring to the risk of HBV transmission in the dental office suggested that many students in the research group underestimated this risk: 30.00% of them considered that the risk is between 1% and 10%. A percentage of 23.33% correctly

estimated the risk as being 11%-30%, and another 23.33% overestimated the risk. Reduced differences were seen by gender ($p=0.316$). However, comparative analysis by year of study revealed significant differences ($p=0.020$) and a direct moderate correlation between estimated risk of HBV transmission and subjects' year of study ($r=0.426$): most of 4th year subjects underestimated the risk, while most students of the 5th and 6th year overestimated the risk and selected the risk interval >50%.

The answers to the question referring to the risk of HCV transmission in the dental office indicated that almost half of the investigated students (43.33%) underestimated this risk. A percentage of 26.67% of the subjects correctly estimated it between 1-10%. Most of the 4th year students underestimated the risk of HCV transmission, while most of the 5th year and

6th year students estimated it correctly, with significant differences ($p=0.024$, $r=0.403$).

The risk of HIV transmission in the dental office was correctly estimated (<1%) by a total number of 20 (33.34%) students in the study sample. Differences by gender were reduced ($p=0.062$), but differences by year of study were important and seen mainly for the answer option "<1%", selected by 41.38% of 4th year subjects, 26.67% of 5th year subjects, and 25.00% of 6th year subjects ($p=0.027$, $r=0.395$).

Assessment of vaccination status against HBV showed that most of the study participants declared that they received full HBV vaccine (73.33%), 18.34% of them were not sure about their vaccination status, and 8.33% said that they did not receive full vaccine against HBV. None of the investigated students selected the answer "No, I'm not". A direct, strong association ($p=0.011$, $r=0.580$) was found between vaccination status and the year of study.

Table II. Frequency of answers concerning the attitude towards patient's infectious status and the knowledge about the risk of blood-borne pathogens transmission

| Question | Total (%) | % by gender | | % by year of study | | |
|---|-----------|-------------|--------|--------------------|-------|-------|
| | | Male | Female | 4th | 5th | 6th |
| 9. Do you take full medical history of your patients? | | | | | | |
| a). Yes, I always do | 33.33 | 34.37 | 32.14 | 10.34 | 33.33 | 75.00 |
| b). Yes, sometimes | 41.67 | 37.50 | 46.43 | 48.27 | 46.67 | 25.00 |
| c). No, I usually don't | 25.00 | 28.12 | 21.43 | 41.38 | 20.00 | 0.00 |
| <i>Sig (p)</i> | | 0.063 | | 0.002* | | |
| <i>Correl (r)</i> | | - | | 0.702 | | |
| 10. What is your attitude towards patients with clinical signs of acute respiratory diseases? | | | | | | |
| a). I do not provide any kind of treatment | 20.00 | 21.87 | 17.86 | 17.24 | 20.00 | 25.00 |
| b). I only provide emergency treatments | 30.00 | 28.12 | 32.14 | 20.69 | 40.00 | 37.50 |
| c). I provide all the necessary treatments | 50.00 | 50.00 | 50.00 | 62.07 | 40.00 | 37.50 |
| <i>Sig (p)</i> | | 0.163 | | 0.016* | | |
| <i>Correl (r)</i> | | - | | -0.374 | | |

| | | | | | | |
|---|-------|-------|-------|--------|-------|-------|
| 11. What is the risk of hepatitis B virus (HBV) transmission in the dental office? | | | | | | |
| a). Less than 1% | 6.67 | 6.25 | 7.14 | 13.79 | 0.00 | 0.00 |
| b). 1%-10% | 30.00 | 28.12 | 32.14 | 41.38 | 20.00 | 18.75 |
| c). 11%-30% | 23.33 | 25.00 | 21.43 | 20.69 | 26.67 | 25.00 |
| d). 31%-50% | 16.67 | 18.75 | 14.28 | 13.79 | 20.00 | 18.75 |
| e). More than 50% | 23.33 | 21.87 | 25.00 | 10.34 | 33.33 | 37.50 |
| <i>Sig (p)</i> | | 0.316 | | 0.020* | | |
| <i>Correl (r)</i> | | - | | 0.426 | | |
| 12. What is the risk of hepatitis C virus (HCV) transmission in the dental office? | | | | | | |
| a). Less than 1% | 43.33 | 46.87 | 39.28 | 68.96 | 26.67 | 12.50 |
| b). 1%-10% | 26.67 | 25.00 | 28.57 | 6.89 | 40.00 | 50.00 |
| c). 11%-30% | 11.66 | 12.50 | 10.71 | 6.89 | 20.00 | 12.50 |
| d). 31%-50% | 11.66 | 9.37 | 14.28 | 3.44 | 13.33 | 25.00 |
| e). More than 50% | 6.67 | 6.25 | 7.14 | 13.79 | 0.00 | 0.00 |
| <i>Sig (p)</i> | | 0.325 | | 0.024* | | |
| <i>Correl (r)</i> | | - | | 0.403 | | |
| 13. What is the risk of Human Immunodeficiency Virus (HIV) transmission in the dental office? | | | | | | |
| a). Less than 1% | 33.34 | 34.37 | 32.14 | 41.38 | 26.67 | 25.00 |
| b). 1%-10% | 30.00 | 25.00 | 35.71 | 41.38 | 20.00 | 18.75 |
| c). 11%-30% | 10.00 | 9.37 | 10.71 | 10.34 | 13.33 | 6.25 |
| d). 31%-50% | 13.33 | 15.62 | 10.71 | 6.89 | 20.00 | 18.75 |
| e). More than 50% | 13.33 | 15.62 | 10.71 | 0.00 | 20.00 | 31.25 |
| <i>Sig (p)</i> | | 0.062 | | 0.027* | | |
| <i>Correl (r)</i> | | - | | 0.395 | | |
| 14. Are you vaccinated against HBV? | | | | | | |
| a). Yes, full vaccine (3 doses) | 73.33 | 71.87 | 75.00 | 65.51 | 80.00 | 81.25 |
| b). Yes, but not full vaccine (only 1 or 2 doses) | 8.33 | 9.37 | 7.14 | 10.34 | 6.67 | 6.25 |
| c). No, I'm not | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d). I don't know | 18.34 | 18.75 | 17.85 | 24.13 | 13.33 | 12.50 |
| <i>Sig (p)</i> | | 0.127 | | 0.011* | | |
| <i>Correl (r)</i> | | - | | 0.580 | | |

*Statistical significance ($p < 0.05$)

The final two questions investigated students' knowledge and practice on sharps disposal in the dental office, and knowledge of post-exposure prophylaxis to blood. The distribution of answers is presented in Table III. A percentage of 43.34% of the students were aware that single-use sharps should be disposed of in the container

marked with "biological risk" symbol, but another important percentage (40.00%) considered that sharps could be disposed of in the medical waste plastic bag nearby the dental chair. Differences were found by gender ($p = 0.026$), with female subjects choosing the correct answer in a higher percentage compared to male subjects

($r=0.281$). Distribution by year of study indicated even more important differences ($p=0.001$): the correct answer option was selected by 68.75% of 6th year students, 66.67% of 5th year students, and 17.24% of 4th year students leading to a direct, strong correlation ($r=0.706$) between the two variables.

An important percentage of the students in the study sample (60.00%) were not sure

about what they must do in case of an accident with exposure to blood. A percentage of 20.00% declared that they did not know about this protocol. Significant differences were found by year of study ($p=0.046$), and a direct, reduced association between knowledge of PEP to blood and subjects' year of study ($r=0.185$).

Table III. Frequency of answers concerning knowledge and practice on sharps disposal and PEP to blood

| Question | Total (%) | % by gender | | % by year of study | | |
|--|-----------|-------------|--------|--------------------|-------|-------|
| | | Male | Female | 4th | 5th | 6th |
| 15. Where do you dispose of single-use sharps (e.g., syringe needles)? | | | | | | |
| a). In the household waste bin | 16.66 | 18.75 | 14.28 | 34.48 | 0.00 | 0.00 |
| b). In the medical waste plastic bag nearby the dental chair | 40.00 | 43.75 | 35.71 | 48.27 | 33.34 | 31.25 |
| c). In the container marked with "biological hazard" symbol | 43.34 | 37.50 | 50.00 | 17.24 | 66.67 | 68.75 |
| <i>Sig (p)</i> | | 0.026* | | 0.001* | | |
| <i>Correl (r)</i> | | 0.281 | | 0.706 | | |
| 16. Do you know the complete post-exposure protocol (PEP) to blood in the dental office (what you must do in case of accidental puncture/lesion with a contaminated instrument)? | | | | | | |
| a). Yes, I know | 20.00 | 18.75 | 21.49 | 17.24 | 20.00 | 25.00 |
| b). I'm not sure | 60.00 | 59.37 | 60.71 | 58.62 | 60.00 | 62.50 |
| c). No, I don't know | 20.00 | 21.87 | 17.85 | 34.48 | 20.00 | 12.50 |
| <i>Sig (p)</i> | | 0.071 | | 0.046* | | |
| <i>Correl (r)</i> | | - | | 0.185 | | |

*Statistical significance ($p<0.05$)

DISCUSSION

Graduates in dental education should have a very good level of clinical skills and knowledge of infection control. Despite many guidelines and protocols made by the medical and dental associations, many studies show that dental undergraduates lack the required knowledge and clinical skills about infection control and that

infection is not controlled well in some dental settings [16, 17].

Overall, the level of preventive measures adopted within the studied group for the control of work-related infections in the dental office can be rated as quite good. The wearing of personal protective equipment, an essential element of the Standard Precautions Concept, was declared by the majority of the subjects

included in the study. However, the results suggest the existence of some gaps in what concerns their knowledge and practices towards the prevention of work-related infections. The years of preparation during faculty represent the time when certain skills can be acquired, which are maintained throughout the future career, therefore it is very important that these skills are correct.

A similar study conducted in Germany in 2017 [18] indicated higher percentages of students wearing complete protective equipment: 94% of the study participants always wore protective gloves, 87% always wore a surgical mask and 67% always wore protective goggles. On the other hand, the study conducted by Saquib in Saudi Arabia concluded that only 73.2% of the students regularly use personal protection equipment [19].

Hand hygiene is one of the very simple, but effective methods of infection control in medical settings. The results of the present study indicated that only half of the investigated subjects performed routine hand hygiene after each dental procedure. This result can be explained by the fact that wearing protective gloves can give the impression of total protection of the hands, which is incorrect, but, unfortunately, it also represents a fairly widespread opinion even among experienced practitioners.

Taking full medical history of the patient is another important element in the prevention of work-related infections, even under the conditions of adopting the measures of the Concept of Standard Precautions. The results of the present study indicated that only one third of the students included in the research routinely performed this investigation of the patient.

Providing dental treatment to patients with clinical signs of acute respiratory diseases has gained particular importance in the conditions of the SARS-CoV-2 pandemic [20, 21, 22]. The recognition of the cases that allow dental treatment to be granted under security conditions, or those that require treatment to be delayed, are essential elements in limiting the transmission of airborne contaminants. The subjects included in the present study declared in a proportion of 50% that they would provide all necessary treatments to such patients, which suggests the need for a better awareness of the risks to which they are exposed.

The main blood-borne pathogens (HBV, HCV and HIV) have specific risks of transmission in the dental office, that were known by approximately 25-30% of the students included in the current study. This fact suggests the need for a better awareness of young practitioners, because knowledge of the real risk of transmission of pathogens allows the adoption of appropriate measures for infection control. In Croatia, a recent study targeting dental students [17] showed that the overall level of HBV- and HCV-related knowledge was poor, with the mean scores of 61.90% and 51.35%, respectively. In India, in studies assessing undergraduate students for knowledge, attitude, and practice toward infection control, 40% of the interns, 40% of the final-year students, and 42% of the 3rd-year students had precise knowledge about infection control measures [16, 23-26].

A primary prevention measure against blood-borne pathogens is vaccination, currently available only against HBV [27]. Full vaccination was declared by 73.33% of the students included in the present study,

but there was also a percentage of more than 25% of subjects who had not completed the full vaccine or did not know their exact vaccination status. An approximately equal percentage was found in Saudi Arabia (78%) [19], while the study conducted in Bulgaria [28] indicated that only 57.4 % of students knew their vaccination status. On the contrary, a study in Germany found a percentage of 94% of the participants who were fully vaccinated against hepatitis B [18].

Correct waste management is another important measure in controlling work-related infections in the dental office. Improper disposal of single-use sharps can lead to work accidents with particularly serious consequences. The results of the present study showed that only a percentage of 43% of the investigated students realized proper disposal of single-use sharps, which suggests the need for a better awareness of the risks to which they and the entire dental team are exposed.

The specialized literature shows that, even if safety measures are adopted, accidents with exposure to blood are frequent in the dental office. In such cases, the correct and timely application of tertiary prevention measures (PEP) and the appropriate reporting of the accident are very important. The fact that a large percentage of the students included in the present study did not know these measures or were not sure about them indicates the

need for more in-depth training in this regard. Similar results were obtained by Ramich in Germany, where 50% of students did not know the standardized procedure of HIV-PEP [18].

Health-care workers are at serious risk of impairing their health status because of transmissible infections, which occur due to lack of knowledge, attitude, and practice about various infection control measures [29, 30]. For this reason, accessing the level of knowledge and attitude of undergraduate dental students becomes an important issue in ensuring that appropriate preventive measures are applied and a safe working environment is created.

CONCLUSIONS

Most of the dental students included in the present study were aware of the risk of work-related infections and reported preventive attitudes. Female subjects have the same risk perception of work-related infections as male subjects but apply the preventive measures to a greater extent. Students from older years demonstrate a better risk perception of work-related infections and apply to a greater extent the corresponding preventive attitudes. The results of the study suggest the need for continuous information and a better awareness of young practitioners on work-related infections and preventive measures in dentistry.

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