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Research Article / Araştırma Makalesi

Evaluation of the Awareness of Sterilization and Disinfection Among Dentistry Faculty Students

Diş Hekimliği Fakültesi Öğrencilerinin Sterilizasyon ve Dezenfeksiyon Konusundaki Farkındalığının Değerlendirilmesi

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Abstract: In recent years, the increase in diseases transmitted through blood and other body fluids has raised awareness about the implementation of sterilization and disinfection in the field of dentistry. The aim of this study is to examine the current practices and sensitivities of dental students regarding infection control, sterilization, and disinfection in the Oral, Dental, and Maxillofacial Surgery Clinic. The participating students were asked to answer a questionnaire consisting of 20 multiple-choice questions related to sterilization and disinfection. Questions prepared in the form of a Likert scale were classified with a 5-point scale and scored as "strongly disagree (1), disagree (2), undecided (3), agree (4), strongly agree (5). Data were analyzed using descriptive statistical methods, Shapiro-Wilk, Mann Whitney U and chi-square test. The study group consisted of a total of 150 students, with 71 (47.3%) being 4th and 79 (52.7%) being 5th grade students. The average age of the group was found to be 23.28 ± 1.12 years. When comparing the importance of handwashing when working with gloves and the disinfection of rotary instruments for infection control between 4th and 5th grade dentistry students, the results were significantly in favor of the 5th grade dentistry students ($p<0.05$). The average scores of the responses regarding sterilization and disinfection were 73.91 for the 4th-grade students and 76.93 for the 5th-grade students. When the scores were compared between the two grades, no statistically significant difference was found ($p>0.05$). It has been revealed that dentistry students need to be careful regarding sterilization and disinfection.
Keywords: Disinfection, Oral Surgery, Sterilization

Özet: Son yıllarda kan ve diğer vücut sıvıları ile bulaşan hastalıklardaki artış, diş hekimliği alanında sterilizasyon ve dezenfeksiyon uygulanmasına yönelik farkındalığı artırmıştır. Araştırmanın amacı, diş hekimliği öğrencilerinin Ağız, Diş ve Çene Cerrahisi Polikliniğinde enfeksiyon kontrolü, sterilizasyon ve dezenfeksiyon konusundaki mevcut uygulamaları ve bu konulara duyarlılıklarını incelemektir. Ankete katılan diş hekimliği öğrencilerine sterilizasyon, dezenfeksiyon ve enfeksiyon ile ilgili çoktan seçmeli 20 sorudan oluşan soruları cevaplamaları istenmiştir. Likert ölçeği şeklinde hazırlanan sorular 5 puanlı skala ile sınıflandırılmış olup ‘’kesinlikle katılmıyorum (1), katılmıyorum (2), kararsızım (3), katılıyorum (4), kesinlikle katılıyorum (5) şeklinde puanlanmıştır. Veriler, tanımlayıcı istatistiksel metotlar, Shapiro-Wilk, Mann Whitney U ve ki kare testi kullanılarak analiz edilmiştir. Çalışma grubunu 71 (%47.3) 4. sınıf ve 79 (%52.7) 5. sınıf öğrencisi olmak üzere toplam 150 öğrenci oluşturmuştur. Grubun yaş ortalaması 23.28 ± 1.12 yıl olarak bulundu. Eldivenle çalışırken el yıkamanın önemi ve döner aletlerin dezenfekte edilmesinin enfeksiyon açısından kontrolü 4. ve 5. Arasında değerlendirildiğinde 5. Sınıflar lehine anlamlı bulundu ($p<0.05$). 4.ve 5. sınıfların sterilizasyon ve dezenfeksiyon konusunda verdiği cevapların puanlarının toplam ortalaması sırasıyla, 73.91 ve 76.93 olarak bulundu. Sorular üzerinden toplanan puanlar sınıflar arasında karşılaştırıldığında istatistiksel olarak anlamlı farklılık bulunmadı ($p>0.05$). Diş hekimliği öğrencilerinin sterilizasyon ve dezenfeksiyonla ilgili dikkatli davranmaları gerektiğini ortaya çıkarmıştır.
Anahtar Kelimeler: Dezenfeksiyon, Oral Cerrahi, Sterilizasyon

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1. Introduction

Disinfection is the process of purifying an object or environment from microorganisms so that it does not become a source of infection. Sterilization is the process of completely destroying all microorganisms in an object or environment, including spores (1).

Patient circulation is quite high in dentistry faculties during the day. For this reason, sterilization and disinfection practices are of great importance in terms of infection control in oral and maxillofacial surgery outpatient clinics where patient circulation is high (2). Since patients' mouths are constantly open during dental treatments, pathogenic microorganisms originating from viruses or bacteria in the patients' mouths can easily be transmitted to dentists, dental students and other employees directly through saliva, blood or aerosols dispersed into the air, or indirectly through contaminated tools (3).

It is critical for dentistry faculty students to have a high level of awareness on this issue for both patient safety and their own health. Evaluating students' knowledge and skills on this subject is necessary to increase the effectiveness of educational programs and eliminate deficiencies (4). It is important for them to act in accordance with sterilization and disinfection protocols in order to put the knowledge they have learned into practice. Failure to implement these processes correctly may cause the spread of infections, increase complications, and prolong the healing process.(5). Increasing the knowledge level of dental students about sterilization and disinfection is critical for infection control. In order to increase students' awareness on this subject, it is recommended to include sterilization and disinfection issues more comprehensively in the education curriculum and to organize seminars (6). This study aimed to determine the awareness levels of dentistry faculty students about sterilization and disinfection. In the survey, students' knowledge levels about sterilization and disinfection, their application habits and the adequacy of their training on this subject were questioned.

2. Materials and Methods

This study was applied to 4th and 5th grade students of Faculty of Dentistry. The total number of students participating in our study is 150. In order to distinguish clinical awareness from preclinical awareness, first, second and third grade students were not included in the study. All procedures performed in the study were approved by the Non-Interventional Ethics Committee of Eskişehir Osmangazi University (approvel no: 2023/05) and were in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. A 20-question survey was applied to the participants of the study to measure their knowledge level about sterilization, disinfection and infection. Since the study was voluntary, the purpose of the research was explained to the sampled students before starting the research, and their verbal permission was obtained. On the first page of the survey form, there is a brief information about the study. 20-item multiple-choice questions designed to determine students' attitudes, prepared in the form of a five-point Likert scale, were evaluated with a 5-point scale as "strongly disagree (1), disagree (2), undecided (3), agree (4), strongly agree (5) scored. In the survey content, the questions used to measure the consciousness and awareness level of the students include whether the standard procedures that must be followed in accordance with the cross-infection and protection protocol are followed, whether gloves and masks are used while at the bedside, hand washing habits, patient chair and clinic disinfection, whether there is contamination with sharp-edged tools. and subsequently, the status of hospital admission and the students' status and awareness about HBV, HCV and HIV were questioned. Statistical analysis of the data was performed with the help of SPSS 22.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistical methods, Shapiro-Wilk, Mann Whitney U and Chi-square test were used to analyze the data. Statistical significance was evaluated at $p<0.05$

3. Results

In this study, 150 students from the 4th and 5th grades of the Faculty of Dentistry at participated, comprising 78 females and 72 males aged between 21 and 28 years (Mean age: 23.28 ± 1.12). Among the participants, 71 (47.3%) were in the 4th grade and 79 (52.7%) were in the 5th grade dentistry students.

The study found that 144(96%) of 4th and 5th grade dentisry students were proficient in concepts related to sterilization and disinfection, 146 (97.3%) recognized the critical importance of vaccinating against blood-borne diseases, and 147 (98%) acknowledged the necessity of changing gloves between patients.Responses to questions regarding whether handwashing is unnecessary when wearing gloves and whether disinfecting rotary instruments like handpieces and aerators after use is sufficient for infection control showed statistically significant differences between 4th and 5th grade dentistry students ($p < 0.05$). Specifically, 5th-grade dentistry students were found to be more attentive to disinfecting rotary instruments. (Table 1)

The total score averages for sterilization and disinfection responses were 73.91 for 4th-grade dentistry students and 76.93 for 5th-grade dentistry students, with no statistically significant difference observed between the grades ($p>0.05$). Additionally, there was no statistically significant difference in scores when comparing responses by gender ($p>0.05$).(Table 2)

Table 1. Evaluation of dentistry students' attitudes towards infection control using class variable and chi-square analysis.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	P value
Question 1. As someone undergoing medical training, I believe I have a good grasp of the concepts of sterilization and disinfection.						
4th n (%)	1 (1.4%)	-	2 (2.8%)	37 (52.1%)	31 (43.7%)	0.553
5th n (%)	-	1 (1.3%)	2 (2.5%)	35 (44.3%)	41 (51.9%)	
Question 2. As a dental school student, I acquire sufficient knowledge about sterilization and disinfection concepts during my education.						
4th n (%)	1 (1.4%)	2 (2.8%)	2 (2.8%)	37 (52.1%)	29 (40.8%)	0.871
5th n (%)	-	2 (2.5%)	3 (3.8%)	41 (51.9%)	33 (41.8%)	
Question 3. It is vital for dentists to be vaccinated against blood-borne diseases.						
4th n (%)	1 (1.4%)	-	1 (1.4%)	12 (16.9%)	57 (80.3%)	0.697
5th n (%)	-	-	2 (2.5%)	12 (15.2%)	65 (82.3%)	
Question 4. Before starting any dental treatment, I obtain a detailed medical history from the patient to learn about infectious diseases such as HBV, HCV, and HIV.						
4th n (%)	1 (1.4%)	-	-	13 (18.3%)	57 (80.3%)	0.163
5th n (%)	-	-	3 (3.8%)	9 (11.4%)	67 (84.8%)	
Question 5. Hand washing is required before putting on gloves. Hand hygiene should be provided after the procedure or after removing gloves.						
4th n (%)	1 (1.4%)	4 (5.6%)	-	15 (21.1%)	51 (71.8%)	**0.047***
5th n (%)	3 (3.8%)	-	2 (2.5%)	26 (32.9%)	48 (60.8%)	
Question 6. Changing gloves between patients is necessary.						
4th n (%)	2 (2.8%)	-	-	8 (11.3%)	61 (85.9%)	0.575
5th n (%)	1 (1.3%)	-	-	6 (7.6%)	72 (91.1%)	
Question 7. Even though the contamination on the hands is visible, alcohol hand antiseptic is sufficient for hygiene.						
4th n (%)	1 (1.4%)	5 (7%)	3 (4.2%)	23 (32.4%)	39 (54.9%)	0.362
5th n (%)	6 (7.6%)	5 (6.3%)	5 (6.3%)	19 (24.1%)	44 (55.7%)	
Question 8. I put on the mask before the treatment starts and use it throughout the treatment.						
4th n (%)	2 (2.8%)	6 (8.5%)	7 (9.9%)	26 (36.6%)	30 (42.3%)	0.452
5th n (%)	4 (5.1%)	9 (11.4%)	5 (6.3%)	20 (25.3%)	41 (51.9%)	
Question 9. The sterility of the instruments we use during patient treatment is an important factor in preventing hospital-acquired infections.						
4th n (%)	1 (1.4%)	-	-	13 (18.3%)	57 (80.3%)	0.568
5th n (%)	-	-	1 (1.3%)	15 (19%)	63 (79.7%)	
Question 10. Disinfecting rotating instruments such as contra-angle handpieces and aerators after use is sufficient						

for infection control.						
4th n (%)	10 (14.1%)	22 (31%)	16 (22.5%)	12 (16.9%)	11 (15.5%)	**0.007***
5th n (%)	6 (7.6%)	14 (17.7%)	20 (25.3%)	33 (41.8%)	6 (7.6%)	
Question 11. After a patient's treatment is completed, the rotary instrument used during the treatment should be sterilized.						
4th n (%)	1 (1.4%)	2 (2.8%)	5 (7%)	12 (16.9%)	51 (71.8%)	0.055
5th n (%)	-	-	5 (6.3%)	28 (35.4%)	46 (58.2%)	
Question 12. A physician performing dental treatment should wear protective glasses or a visor throughout the procedure.						
4th n (%)	1 (1.4%)	2 (2.8%)	3 (4.2%)	16 (22.5%)	49 (69%)	0.434
5th n (%)	-	1 (1.3%)	1 (1.3%)	14 (17.7%)	63 (79.7%)	
Question 13. I cover the surfaces touched during the patient's treatment before starting (air-water syringe, unit control panels, tray handles, reflector arms, chair headrests) with waterproof barriers (aluminum foil, cling film, plastic covers).						
4th n (%)	-	1 (1.4%)	3 (4.2%)	29 (40.8%)	38 (53.5%)	0.919
5th n (%)	-	2 (2.5%)	3 (3.8%)	29 (36.7%)	45 (57%)	
Question 14. A unit that has not been disinfected after treating a patient should never be seated for another patient.						
4th n (%)	1 (1.4%)	1 (1.4%)	1 (1.4%)	12 (16.9%)	56 (78.5%)	0.635
5th n (%)	-	-	2 (2.5%)	15 (19%)	62 (78.5%)	
Question 15. I close the syringe with the single-handed technique to prevent needle sticks.						
4th n (%)	2 (2.8%)	2 (2.8%)	4 (5.6%)	19 (26.8%)	44 (62%)	0.599
5th n (%)	1 (1.3%)	-	5 (6.3%)	22 (27,8%)	51 (64.6%)	
Question 16. I know that I need to go to the hospital after being injured by a sharp-edged tool during patient treatment.						
4th n (%)	-	1 (1.4%)	3 (4.2%)	14 (19.7%)	53 (74.6%)	0.767
5th n (%)	-	-	3 (3.8%)	16 (20.3%)	60 (75.9%)	
Question 17. I disinfect materials such as impression materials, impression guns, shade guides, and light curing units that are shared and cannot be sterilized after each use.						
4th n (%)	-	1 (1.4%)	2 (2.8%)	23 (32.4%)	45 (63.4%)	0.055
5th n (%)	-	-	-	15 (19%)	64 (81%)	
Question 18. Before starting a dental procedure, using antiseptic mouthwash for gargling, employing rubber dam, and utilizing high-volume surgical aspirators help prevent the transmission of microorganisms via aerosols.						
4th n (%)	-	1 (1.4%)	4 (5.6%)	20 (28.2%)	46 (64.8%)	0.729
5th n (%)	-	2 (2.5%)	2 (2.5%)	25 (31.6%)	50 (63.3%)	
Question 19. Dentists are responsible for preventing hospital-acquired infections.						
4th n (%)	1 (1.4%)	1 (1.4%)	4 (5.6%)	17 (23.9%)	48 (67.6%)	0.603
5th n (%)	1 (1.3%)	1 (1.3%)	1 (1.3%)	24 (30.4%)	52 (65.8%)	
Question 20. Red colored plastic bag; It should be used for extracted teeth, blood and blood products, and any object contaminated with body fluids.						
4th n (%)	8 (11.3%)	2 (2.8%)	4 (5.6%)	20 (28.2%)	37 (52.1%)	0.077
5th n (%)	4 (5.1%)	2 (2.5%)	1 (1.3%)	14 (17.7%)	58 (73.4%)	

**; statistically significant (p<0.05)*

Variables	**Average Total Scores**	**P value**
Gender		
Female (n=78)	81.72	0.067[a]
Male (n=72)	68.76	
Grade		
4th grade students (n=71)	73.91	0.670[a]
5th grade students (n=79)	76.93	

Table 2. Comparison of scores of participants' gender and grades

[a]*Mann-Whitney U test, *; statistically significant (p<0.05)*

4. Discussion and Conclusion

Dentists, dental students, and ancillary staff are at greater risk than the general population for exposure to blood- or body fluid-borne pathogens (7). Therefore, it is of great

importance for dentistry students who start treating patients in the clinic to perform infection control correctly (8). Various studies suggest that dentists have room for improvement in complying with infection control guidelines and taking standard precautions (9, 10). The study, which assessed the level of knowledge, attitude and practice regarding sterilization/infection control measures among undergraduate dental students in Kashmir, reported high levels of concern and awareness regarding sterilization and infection control protocols among the students. Nearly all students were aware of the importance of autoclaving and reported practicing effective infection control measures, such as using mouth masks and hoods (11).

In the study by Ataç et al.(12) it was stated that there was no significant difference between 4th and 5th grade students in terms of the percentage of correct answers about infection control ($p>0.05$). The results of our study also support this finding and show that there is no significant difference between 4th and 5th grade students. According to Akbulut et al.(13), research, 97% of students think that sterilization and disinfection of dental instruments is necessary. In their study, Altındiş et al.(14), reported that 62.6% of the students stated that rotating instruments such as aerators should be sterilized after each patient. In our study, although 91.4% of the students said that rotating instruments should be sterilized, 41% of the students said that they could be used after disinfection. We think that this may not fully reflect the infection control practices of dental students and is due to the subjective answers given. The use of personal protective equipment such as gloves, masks and visors in dentistry is effective in preventing infections.(15). Although gloves are a critical component of infection control in dental practices, they do not eliminate the need for hand washing (16). The literature strongly supports the use of disposable gloves for every patient and emphasizes the importance of proper hand hygiene practices (17). In their assessment of 303 students, Al-Essa et al.(18) reported that 99.3% acknowledged the necessity of wearing gloves and 98.7% recognized the importance of wearing masks. Similarly, in our study, although no differences were found between classes, 94.7% of students stated the necessity of working with masks. Kechagia et al.(19) reported high rates of awareness among students regarding the necessity of chair and clinic disinfection between patients (91.5%), changing masks between patients (70.1%), and developing a habit of handwashing after patient examinations (82.9%). However, the rate of handwashing before donning gloves was found to be low at 29.3%. The study attributed this lower rate to the increased workload and patient load experienced by 5th-year students compared to their peers, highlighting potential neglect in handwashing before glove use as a significant concern. In our study, 93.3% of students stated that handwashing is not necessary when gloves are worn. This indicates a need for informing and educating students about this compliance issue. In the study by Al-Essa et al.(18) awareness regarding disinfection and sterilization was reported at 98.7%. In our study, 96.7% of students agreed that an operatory that has not been disinfected after treating a patient should never be used for another patient. This high percentage indicates a strong awareness level regarding asepsis, antisepsis, and disinfection practices. It underscores the importance of taking patient histories and questioning about infectious disease prior to dental treatments to enhance measures aimed at preventing cross-infection (20). Balcheva et al. (21) reported that 96.8% of students take patient histories, while Altındiş et al.(14) indicated that 82.7% of students always inquire about infectious disease histories before dental treatments. Similarly, in our study, 97.4% of students stated that they take patient histories regarding infectious disease risks before initiating dental treatments.

Literature reviews emphasize that instruments like handpieces and micromotors pose a significant risk of cross-infection during dental procedures and must be sterilized for each patient. Areas such as air-water syringes, unit control panels, tray handles, reflector arms, and chair headrests should be covered with aluminum foil, plastic wrap, or

disposable barriers and changed for every patient (22). Alternatively, these areas should be cleaned with EPA-approved disinfectants in sufficient quantity and contact time. Considering both aerosols and glove contact, these areas have the potential to harbor contamination and should be carefully managed (23). In our study, 145 out of 150 dentistry students agreed that these measures should be implemented for each patient.

It is crucial to obtain a detailed medical history from the patient, focusing particularly on infectious diseases such as HBV, HCV, and HIV, before initiating any dental treatment (24). Furthermore, the prevalence of HBV and HCV among patients undergoing dental treatment underscores the need to increase awareness and implement preventive measures in dentistry (25). Given the prevalence of HBV infections and the frequent exposure of healthcare workers, including dentists, to needlestick injuries, it is crucial to use the one-handed needle recapping technique to protect healthcare workers from infections (26, 27). In a study conducted, it was reported that one-quarter of sharp instrument injuries in dentistry result from needlestick incidents (28). In a study by Gümüşsoy et al.(26), it was reported that 57% of students did not prefer the one-handed needle recapping technique, indicating insufficient awareness among healthcare workers regarding the associated risks. However, in our study, 146 (97.4%) dentistry students reported querying the history of potential infectious diseases such as HBV, HCV, and HIV before procedures, demonstrating high awareness of infectious diseases. Additionally, 136 (90.6%) dentistry students preferred the one-handed needle recapping technique, with no significant difference observed between 4th and 5th-grade dentistry students. These findings suggest that students generally maintain high awareness of needlestick injury risks.

Pre-procedural antiseptic mouth rinses, rubber dams, and high-volume surgical suction provide a comprehensive strategy for infection control in dental practices. Using these measures together can significantly enhance the effectiveness of infection prevention (29). Antiseptic mouthwash reduce the microbial load in the oral cavity, while rubber dams and high-volume surgical suction work together to limit the spread and inhalation of aerosols (29). 129 (86%) dentistry students who participated in the survey showed that they were aware of the fact that mouthwash, rubber dam and high-power surgical aspirators prevent contamination before the procedure.

In conclusion, dental students generally demonstrate satisfactory knowledge and practices regarding sterilization and disinfection. However, there is a clear need for continuous improvement in education and training methods to ensure comprehensive understanding and implementation of these critical procedures.

REFERENCES

1. Al Mortadi N, Al-Khatib A, Alzoubi KH, Khabour OF. Disinfection of dental impressions: knowledge and practice among dental technicians. Clin Cosmet Investig Dent. 2019;11:103-8.
2. García Perla A, Gutiérrez Perez JL, Bermudo Añino L, Moiguer G. Sterilization and disinfection in oral and maxillofacial surgery. Arch Odonto Estomatol. 1987;3(2):53-63.
3. Bulut E, Burcu B, Soykan S. Serbest Diş Hekimliği Muayenehanelerinde Sterilizasyon, Dezenfeksiyon ve İnfeksiyon Kontrolünün Değerlendirilmesi. Ondokuz Mayıs Üniversitesi Diş Hekimliği Fakültesi Dergisi. 2013;14(2):21-6.
4. Alharbi G, Shono N, Alballaa L, Aloufi A. Knowledge, attitude and compliance of infection control guidelines among dental faculty members and students in KSU. BMC Oral Health. 2019;19(1):7.
5. Palenik CJ, Burke FJ, Miller CH. Strategies for dental clinic infection control. Dent Update. 2000;27(1):7-10,
6. Deogade SC, Mantri SS, Saxena S, Sumathi K. Awareness and Knowledge of Undergraduate Dental Students about Sterilization/Disinfection Methods of

Extracted Human Teeth. Ann Med Health Sci Res. 2016;6(6):348-55.
7. Bulut ÖE, Bulut A, Soydan SS. Dişhekimliği Muayenehanelerinde Son Çeyrek Yüzyıla Ait Dezenfeksiyon, Antisepsi, Sterilizasyon DAS Uygulamaları. ADO Klinik Bilimler Dergisi. 2013;6(4):1347-56.
8. Yılmaz MZ, Torun AÇ, Şentürk F, Muğlalı M, Özkan N. Diş hekimliğinde enfeksiyona maruz kalma ve korunma yöntemlerinin mesleki deneyim ve kliniklere göre dağılımının değerlendirilmesi. Abant Medical Journal. 2015;4(1):33-7.
9. Singh A, Purohit BM, Bhambal A, Saxena S, Singh A, Gupta A. Knowledge, attitudes, and practice regarding infection control measures among dental students in Central India. J Dent Educ. 2011;75(3):421-7.
10. de Souza RA, Namen FM, Galan J, Jr., Vieira C, Sedano HO. Infection control measures among senior dental students in Rio de Janeiro State, Brazil. J Public Health Dent. 2006;66(4):282-4.
11. Singh M, Sahota J, Singh P, Sharma T, Gupta S, Mahajan T, et al. Assessment of the level of knowledge, attitudes and practices regarding sterilisation/infection control measures among undergraduate dental students in Jammu City, Jammu and Kashmir: A cross-sectional study. Journal of Clinical and Scientific Research. 2022;11(1):13-6.
12. Ataç AS, Erbudak HÖ, Arslan U. Hacettepe Üniversitesi Diş Hekimliği Fakültesi klinik öğrencilerinin enfeksiyon kontrolü konusundaki bilgi düzeylerinin değerlendirilmesi. Hacettepe Dis Hek Fak Derg. 2008;32:10-7.
13. Akbulut N, Öztaş B, Kurşun S, Çölok G. Knowledge, attitude and behaviour regarding hepatitis B and infection control in dental clinical students. Clin Dent Res. 2011;35(2):21-7.
14. Altındiş A, Cumhur A, Kahraman EP, Köseoğlu M. Diş Hekimliği Fakültesi Öğrencilerinin Enfeksiyon Kontrolü Konusundaki Farkındalıkları ve Tutumlarının Değerlendirilmesi. Journal of Biotechnology and Strategic Health Research. 2018;2(3):196-204.
15. Verrusio AC, Neidle EA, Nash KD, Silverman S, Jr., Horowitz AM, Wagner KS. The dentist and infectious diseases: a national survey of attitudes and behavior. J Am Dent Assoc. 1989;118(5):553-62.
16. Gobetti JP, Cerminaro M, Shipman C, Jr. Hand asepsis: the efficacy of different soaps in the removal of bacteria from sterile, gloved hands. J Am Dent Assoc. 1986;113(2):291-2.
17. Dhamdhere N, Vishnani R, Reche A, Paul P, Rathi S, Bolenwar A. Hand Scrubbing and Donning of Sterile Surgical Gloves: An Observational Clinical Audit of Novice Dental Surgeons. Cureus. 2023;15(8):e43504.
18. AL-Essa NA, AlMutairi MA. To what extent do dental students comply with infection control practices? The Saudi Journal for Dental Research. 2017;8(1):67-72.
19. Kechagia N, Sadry S. Diş hekimliği fakültesi öğrencilerinin çapraz enfeksiyon kontrolü, bilgi ve farkındalıklarının değerlendirilmesi. 7tepe Klinik Dergisi. 2021;17(1):9-15.
20. Milward MR, Cooper PR. Competency assessment for infection control in the undergraduate dental curriculum. Eur J Dent Educ. 2007;11(3):148-54.
21. Balcheva M, Panov VE, Madjova Ch BG. Occupational infectious risk in dentistry-awareness and protection. J of IMAB. 2015;21(4):995-9.
22. Brinker SP, Baker G. Behind-the-Scenes Infection Prevention: Focusing on Clinical Surfaces and Instrument Processing. Compend Contin Educ Dent. 2023;44(9):504-8.
23. Al-Makramani BMA. Infection Control in Dental Clinics: Prosthodontics Perspectives. J Contemp Dent Pract. 2022;23(9):953-61.
24. Azatyan V, Yessayan L, Khachatryan A, Perikhanyan A, Hovhannisyan A, Shmavonyan M, et al. Assessment of pathomorphological characteristics of the oral mucosa in patients with HBV, HCV and HIV. J Infect Dev Ctries. 2021;15(11):1761-5.
25. Gupta S, Latoo SH. A Study on HIV, Hepatitis B and Hepatitis C among Dental Patients Screened from Different Districts of Kashmir Valley.
26. Gümüşsoy İ, Kartal F, Yılmaz D, Toptan H, Altındiş S, Duman ŞB. Diş hekimlerinin enfeksiyon kontrolü, sterilizasyon ve dezenfeksiyon konusundaki duyarlılık ve uygulamaları. 7tepe Klinik Dergisi. 2019;15(3):345-8.
27. Zachar JJ, Reher P. Percutaneous exposure injuries amongst dental staff and students at a university dental clinic in Australia: A 6-year retrospective study. Eur J Dent Educ. 2022;26(2):288-95.
28. Cleveland JL, Barker LK, Cuny EJ, Panlilio AL. Preventing percutaneous injuries among dental health care personnel. J Am Dent Assoc. 2007;138(2):169-78; quiz 247-8.
29. Sevinç Gül SN, Dilsiz A, Sağlık İ, Aydın NN. Effect of oral antiseptics on the viral load of SARS-CoV-2: A randomized controlled trial. Dent Med Probl. 2022;59(3):357-63.

Ethic

Ethics Committee Approval: The study was approved by Eskişehir Osmangazi University Noninterventional Clinical

Research Ethical Committee (Decision no:5, Date: 25.07.2023).
Authorship Contributions: Concept: NSK, GÇ, Design: NSK, GT, Data Collection or Processing: GÇ, GT, Analysis or Interpretation: NSK, Literature Search: NSK,GT,GÇ Writing: GT,NSK,GÇ.

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