

Assessment of the Dental Students' Knowledge and Attitudes Toward Bleeding Control in Turkey: A National Survey

Türkiye'de Dişhekimliği Öğrencilerinin Kanama Kontrolüne Yönelik Bilgi ve Tutumlarının Değerlendirilmesi: Ulusal Bir Araştırma

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ABSTRACT

Introduction: The dentistry curriculum for oral and maxillofacial surgery internship should comprise bleeding control, correct intervention to abnormal bleeding, knowledge of hemostatic agents, and applications. This study aimed to determine the level of knowledge and attitudes of a group of Turkish dental students regarding bleeding intervention, hemostatic agents and anticoagulants after clinical practice during internship.

Methods: A three-part survey was given to dental students from September 2018 to June 2019. Section 1 asked about students' competence in bleeding intervention with eight questions. Section 2 assessed students' knowledge of hemostatic agents with three questions. Section 3 addressed students' knowledge of anticoagulants with four questions. Students were asked to self-rate their knowledge of bleeding intervention, hemostatic agents, and anticoagulants on a scale of 1 to 5.

Results: A total of 1150 students from different universities in Turkey participated in the study. The fifth-year students performed better on all questions, and their total score was statistically significantly higher; male students rated themselves higher than female students. In sections 2 and 3, which measure the knowledge level of students, the percentage rates were higher than in section 1.

Discussion and conclusion: The dental students' attitude toward and knowledge of bleeding, hemostatic agents and anticoagulants were at a moderate level. In addition, regardless of the group, the ability to use electrocautery was poor in all students.

Keywords: Anticoagulants; Education, Dental; Hemorrhage; Hemostasis; Hemostatics; Self-Assessment; Students, Dental

ÖZ

Giriş ve Amaç: Ağız, Diş ve Çene Cerrahisi stajı için diş hekimliği fakültesi ders müfredatı kanama kontrolü, anormal kanamaya doğru müdahale, hemostatik ajan bilgisi ve bu konuda yapılan uygulamaları içermelidir. Bu çalışmada, farklı fakültelerden katılan bir grup Türk diş hekimliği öğrencisinin staj süresince klinik uygulama sonrası kanama müdahalesi, hemostatik ajanlar ve antikoagülanlar ile ilgili bilgi ve tutumlarının belirlenmesi amaçlanmıştır.

Yöntem ve Gereçler: Eylül 2018 tarihinden Haziran 2019'a kadar diş hekimliği öğrencilerine üç bölümden oluşan bir anket verildi. Bölüm 1, sekiz soruyla öğrencilerin kanama müdahalesi yeterliliğini sorgulamaktadır. Bölüm 2, öğrencilerin hemostatik ajanlar hakkındaki bilgilerini üç soruyla değerlendirmektedir. Bölüm 3, öğrencilerin antikoagülanlarla ilgili bilgilerini dört soruyla ele almaktadır. Öğrencilerden kanama müdahalesi, hemostatik ajanlar ve antikoagülanlar hakkındaki bilgilerini 1 ile 5 arasında derecelendirmeleri istendi.

Bulgular: Araştırmaya Türkiye'deki farklı üniversitelerden toplam 1150 öğrenci katılmıştır. Beşinci sınıf öğrencileri tüm sorularda daha iyi performans gösterdi ve toplam puanları istatistiksel olarak anlamlı derecede dördüncü sınıf öğrencilerinden daha yüksekti; erkek öğrenciler kendilerini kız öğrencilere göre daha yüksek puanlamışlardır. Öğrencilerin bilgi düzeyini ölçen 2. ve 3. bölümlerde yüzde oranları 1. bölümden daha yüksek bulunmuştur.

Tartışma ve sonuç: Diş hekimliği öğrencilerinin kanama, hemostatik ajanlar ve antikoagülanlara karşı tutumu ve bilgisi orta seviyede bulunmuştur. Ayrıca gruptan bağımsız olarak elektrokoter kullanma becerisi tüm öğrencilerde zayıf olarak gözlemlenmiştir.

Anahtar Kelimeler: Antikoagülanlar, diş hekimliği eğitimi, kanama, hemostaz, hemostatik ajanlar

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INTRODUCTION

Bleeding disorders and management of bleeding control are important before the intervention in dentistry. Dentists should be well aware of the management of such patients with a tendency to bleeding while performing dental treatment.¹ Also, necessary precautions and approaches should be implemented not to encounter abnormal bleeding after a surgical procedure.²

The theoretical training of dentistry lasts for 5 years, while the clinical training is given in the last 2 years.³ The dental curriculum in Turkish universities implements training on systemic diseases, bleeding intervention, and hemostatic agents in the fourth year. In the oral and maxillofacial surgery internship, the expectations from dental students for patients with cardiological and hematological diseases are the correct application of steps and methods.

The aim of this study was to determine the level of knowledge and attitudes of a group of Turkish dental students regarding anticoagulants, bleeding intervention, and hemostatic agents after clinical practice internship.

METHODS

Selection and Description of Participants

This was a cross-sectional study conducted from September 2018 to June 2019 using a self-administered questionnaire on fourth- and fifth (final)-year dental students in Turkey. It was approved by the clinical research ethics committee of the Ankara University, (19/02/18). All participants gave written informed consent after having received information regarding the study design and protocol. Fourth- and fifth (final)-year dental students from seven dental school in Turkey: Ankara University, Hacettepe University, Marmara University, Eskişehir Osmangazi University, Dicle University, Süleyman Demirel University University, and Kırıkkale University participated in the study. Students were given the questionnaire in print, by mail, or via Google forms. The study population comprised students who received theoretical training on anticoagulants, bleeding intervention, and hemostatic agents and completed the oral and maxillofacial surgery internship.

Technical information

A survey comprising three parts was applied to dental students. Section 1 asked about students' competence in bleeding intervention with eight questions. Section 2 assessed students' knowledge of hemostatic agents with three questions. Section 3 addressed students' knowledge of anticoagulants with four questions. Students were asked to self-rate their knowledge of bleeding intervention, hemostatic agents, and anticoagulants on a scale of 1 to 5. The response options were as follows: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree (Fig. 1). Students were informed that this was not an examination or individual assessment

and hence they should be fair in their responses. No names were written on the questionnaire. Demographic data consisted of dental student's degree and sex. The mean of dental students' scores acquired from their responses were used for the ranked evaluation of the knowledge level. Thus, scores were categorized into three levels: poor (1–2.33), moderate (2.34–3.66), and good (3.67–5).

Figure 1. Survey questions for self-assessment of students

| Kanama Farkındalık Anketi | | | | | | |
|--|---|---|---|---|---|---|
| Cinsiyet: | | | | | | |
| Dönem: | | | | | | |
| 1- Bu konuda herhangi bir bilgi yok- Kesinlikle katılmıyorum | | | | | | |
| 2- Bu konuda bilgi kısıtlı-Kisimden katılmıyorum | | | | | | |
| 3- Bu konuda bilgi orta derecede- Kararsızım | | | | | | |
| 4-Bu konuda bilgi yeterli-Kisimden Katılıyorum | | | | | | |
| 5-Bu konuda bilgi çok iyi-Kesinlikle Katılıyorum | | | | | | |
| 1) | Dış çekiminden sonra karşılaşıcağım kanamanın normal bir kanama olup olmadığını ayırt edebilirim. | 1 | 2 | 3 | 4 | 5 |
| 2) | Gelen kanın osseöz yada yumuşak doku kaynaklı olduğunu ayırt edebilirim kanama | 1 | 2 | 3 | 4 | 5 |
| 3) | Gelen kanın arteriyel yada osseöz olup olmadığını ayırt edebilirim kanama | 1 | 2 | 3 | 4 | 5 |
| 4) | Çekim Sonrası oluşabilecek anormal bir kanamayı durdurabilecek yeterliliğe kanama sahibim | 1 | 2 | 3 | 4 | 5 |
| 5) | Osseöz bir kanamayı durdurabilecek yeterliliğe sahibim | 1 | 2 | 3 | 4 | 5 |
| 6) | Arteriyel bir kanamayı durdurabilecek yeterliliğe sahibim | 1 | 2 | 3 | 4 | 5 |
| 7) | Aşırı kanamaya sebep olabilecek sistemik durumlar hakkında bilgi sahibiyim | 1 | 2 | 3 | 4 | 5 |
| 8) | Hemostatik ajanların ne olduğunu biliyorum | 1 | 2 | 3 | 4 | 5 |
| 9) | Hemostatik ajanların etki mekanizmasını biliyorum | 1 | 2 | 3 | 4 | 5 |
| 10) | Hemostatik ajanları nasıl kullanacağımı biliyorum | 1 | 2 | 3 | 4 | 5 |
| 11) | Kanama kontrolünde elektrokoter kullanabilecek yeterlikteyim | 1 | 2 | 3 | 4 | 5 |
| 12) | Antikoagülan ve antiagregan kullanan hastalara nasıl yaklaşacağımı biliyorum | 1 | 2 | 3 | 4 | 5 |
| 13) | Antikoagülan ve antiagreganların hangi tip hastalıklarda kullanıldıklarını biliyorum | 1 | 2 | 3 | 4 | 5 |
| 14) | Dış çekimi açısından önemli olan laboratuvar testlerini ve değerlerini biliyorum | 1 | 2 | 3 | 4 | 5 |
| 15) | Kendimi günlük hayatta aşırı kanama ile karşılaştığımda acil müdahale edebilecek yeterlilikte görüyorum | 1 | 2 | 3 | 4 | 5 |

Statistics

The distribution of the data was checked using the Shapiro–Wilk test. The data were not normally distributed, and hence nonparametric tests were applied. Then, the knowledge difference between fourth- and fifth-year students was compared using the Mann–Whitney *U* test. The level of significance was set at *P* <0.05.

RESULTS

A total of 1150 students from different universities in Turkey participated in the study. Of these, 676 were fourth-year students and 474 were fifth-year students (Table 1). When the competence regarding bleeding intervention and knowledge of hemostatic agents and anticoagulants was compared between fourth- and fifth-year students, the fifth-year students performed better on all questions, and their total score was statistically significantly higher (Table 2).

Table 1. Demographic characteristics of students

| Sex | Fourth year (n = 676) | Fifth year (n = 474) | <i>P</i> value* |
|--------|--------------------------|-------------------------|-----------------|
| Female | 396 | 296 | 0.187273 |
| Male | 280 | 178 | |

*Pearson chi square test.

Table 2. Self-rated competence in bleeding intervention and knowledge of hemostatic agents and anticoagulants

| | | Male | Female | P value* | Total | Level |
|------------------|-------------------------|-------------|--------------------|---------------------|-------------|----------|
| SECTION 1 | | | | | | |
| Q-1 | Fourth year | 3.62 ± 0.81 | 3.65 ± 0.9 | 0.32708 | 3.64 ± 0.86 | Moderate |
| | Fifth year | 3.79 ± 0.74 | 4.01 ± 0.82 | 0.00262 | 3.93 ± 0.8 | Good |
| Q-2 | Fourth year | 2.6 ± 1.02 | 2.65 ± 1 | 0.38978 | 2.63 ± 1.01 | Moderate |
| | Fifth year | 3.1 ± 0.97 | 3.35 ± 0.93 | 0.00714 | 3,25 ± 0,95 | Moderate |
| Q-3 | Fourth year | 2.99 ± 1.17 | 2.97 ± 1.12 | 0.9442 | 2.98 ± 1.14 | Moderate |
| | Fifth year | 3.51 ± 1 | 3.63 ± 1.04 | 0.22246 | 3.58 ± 1.03 | Moderate |
| Q-4 | Fourth year | 2.64 ± 0.99 | 2.72 ± 0.96 | 0.4009 | 2.69 ± 0.97 | Moderate |
| | Fifth year | 2.91 ± 0.9 | 3.13 ± 0.96 | 0.01046 | 3 ± 0.94 | Moderate |
| Q-5 | Fourth year | 2.3 ± 1.03 | 2.46 ± 1.04 | 0.04036 | 2.39 ± 1.04 | Moderate |
| | Fifth year | 2.73 ± 0.97 | 2.95 ± 1.05 | 0.03318 | 2.87 ± 1.03 | Moderate |
| Q-6 | Fourth year | 2.18 ± 0.96 | 2.19 ± 0.98 | 0.9442 | 2.19 ± 0.97 | Poor |
| | Fifth year | 2.16 ± 0.89 | 2.53 ± 0.97 | 0.00008 | 2.39 ± 0.95 | Moderate |
| Q-7 | Fourth year | 1.48 ± 0.82 | 1.6 ± 0.95 | 0.22628 | 1.55 ± 0.9 | Poor |
| | Fifth year | 1.51 ± 0.78 | 2.12 ± 1.12 | < 0.00001 | 1.89 ± 1.05 | Poor |
| Q-8 | Fourth year | 2.43 ± 0.96 | 2.43 ± 0.96 | 0.9124 | 2.43 ± 0.96 | Moderate |
| | Fifth year | 2.57 ± 0.94 | 2.91 ± 0.99 | 0.00032 | 2.78 ± 0.98 | Moderate |
| Total | Fourth year | 2.53 ± 0.64 | 2.59 ± 0.66 | 0.23014 | 2.56 ± 0.65 | Moderate |
| | Fifth year | 2.79 ± 0.59 | 3.08 ± 0.62 | <0.00001 | 2.97 ± 0.63 | Moderate |
| SECTION 2 | | | | | | |
| Q-9 | Fourth year | 3.39 ± 1.03 | 3.33 ± 1.13 | 0.59612 | 3.35 ± 1.09 | Moderate |
| | Fifth year | 3.64 ± 0.94 | 3.84 ± 0.98 | 0.01828 | 3.77 ± 0.97 | Good |
| Q-10 | Fourth year | 2.96 ± 1.07 | 2.97 ± 1.08 | 0.77182 | 2.97 ± 1.07 | Moderate |
| | Fifth year | 3.07 ± 1.02 | 3.54 ± 1.03 | <0.00001 | 3.36 ± 1.05 | Moderate |
| Q-11 | Fourth year | 2.6 ± 1.08 | 2.73 ± 1.07 | 0.13622 | 2.67 ± 1.08 | Moderate |
| | Fifth year | 2.8 ± 0.97 | 3.33 ± 1.01 | <0.00001 | 3.13 ± 1.02 | Moderate |
| Total | Fourth year | 2.98 ± 0.9 | 3.01 ± 0.95 | 0.5485 | 3 ± 0.93 | Moderate |
| | 5 th year | 3.17 ± 0.82 | 3.57 ± 0.84 | <0.00001 | 3.42 ± 0.85 | Moderate |
| SECTION 3 | | | | | | |
| Q-12 | Fourth year | 3.66 ± 0.89 | 3.63 ± 0.95 | 0.74896 | 3.64 ± 0.93 | Moderate |
| | Fifth year | 3.71 ± 0.84 | 3.91 ± 0.84 | 0.01242 | 3.83 ± 0.85 | Good |
| Q-13 | Fourth year | 3.73 ± 0.86 | 3.53 ± 1 | 0.01928 | 3.61 ± 0.95 | Moderate |
| | Fifth year | 3.84 ± 0.79 | 4.04 ± 0.86 | 0.00544 | 3.97 ± 0.84 | Good |
| Q-14 | Fourth year | 3.61 ± 0.91 | 3.4 ± 1.02 | 0.01928 | 3.49 ± 0.98 | Moderate |
| | Fifth ^h year | 3.72 ± 0.84 | 3.96 ± 0.87 | 0.00174 | 3.87 ± 0.87 | Good |
| Q-15 | Fourth year | 2.97 ± 1.03 | 2.92 ± 1.11 | 0.69654 | 2.94 ± 1.08 | Moderate |
| | Fifth year | 3.15 ± 0.97 | 3.34 ± 1.02 | 0.04136 | 3.27 ± 1 | Moderate |
| Total | Fourth year | 2.87 ± 0.61 | 3.25 ± 0.85 | <0.00001 | 3.09 ± 0.78 | Moderate |
| | Fifth year | 3.2 ± 0.57 | 3.74 ± 0.73 | <0.00001 | 3.54 ± 0.73 | Moderate |

*Mann-Whitney U test.

After tooth extraction, the level of fifth- and fourth-year students of distinguishing normal from abnormal bleeding was good and moderate, respectively. Both fourth- and fifth-year students were "moderate" in understanding the origin of bleeding after tooth extraction. Also, they were "moderate" in seeing themselves as competent in stopping abnormal bleeding and osseous bleeding after tooth extraction. While response percentages in distinguishing normal bleeding were higher in the moderate category among all grades both 4th and 5th grades, it was observed that the scores decreased as a percentage in distinguishing the source of bleeding (Table 3). However, fourth-year students scored themselves "poor" in stopping arterial bleeding after tooth extraction. Both groups of students scored themselves "poor" in using electrocautery to control bleeding. However, they found themselves "moderate" in providing immediate intervention when faced with excessive bleeding in daily life. The total level of section

1: competence in bleeding intervention was "moderate" in both groups. Sex caused a statistically significant difference in half of these items, but it did not cause a statistically significant difference in the remaining items (Table 2).

The level of knowledge of "what the hemostatic agents are" was "good" in fifth-year students but "moderate" in fourth-year students. The level of knowledge of the mechanism and use of hemostatic agents was moderate in the two groups. The total level of section 2: knowledge of hemostatic agents was "moderate" in both groups. In this section, the effect of sex on the items was half as well (Table 2).

The level of knowledge of "systemic diseases that can cause excessive bleeding," "what to take care of before and after tooth extraction in patients using anticoagulants," and "which diseases anticoagulants are used in" was "good" in fifth-year students and

“moderate” in fourth-year students. The level of knowledge of laboratory tests and tooth extraction was “moderate” in the two groups. The total level of section 3: knowledge of anticoagulants was “moderate” in both groups. In this section, the scores of male students were

statistically significantly higher in many items and groups (Table 2). In sections 2 and 3, which measure the knowledge level of students, the percentage rates were higher than in section 1 (Table 3).

Table 3. Percentage distribution of survey responses according to class and gender

| SECTION 1 | | Male | Female | Total | Level |
|-----------|-------------|---|---|-------------|----------|
| | | Percentage (%) | Percentage (%) | | |
| Q-1 | Fourth year | 7.9 (Poor) 32.1 (Moderate) 60.0 (Good) | 10.6 (Poor) 24.7 (Moderate) 64.6 (Good) | 3.64 ± 0.86 | Moderate |
| | Fifth year | 4.0 (Poor) 26.3 (Moderate) 69.7 (Good) | 4.7 (Poor) 16.6 (Moderate) 78.7 (Good) | | |
| Q-2 | Fourth year | 45.7 (Poor) 37.5 (Moderate) 16.9 (Good) | 42.4 (Poor) 37.4 (Moderate) 20.2 (Good) | 2.63 ± 1.01 | Moderate |
| | Fifth year | 26.3 (Poor) 39.9 (Moderate) 33.7 (Good) | 16.9 (Poor) 38.2 (Moderate) 44.9 (Good) | | |
| Q-3 | Fourth year | 36.4 (Poor) 26.8 (Moderate) 36.8 (Good) | 35.3 (Poor) 27.8 (Moderate) 36.9 (Good) | 2.98 ± 1.14 | Moderate |
| | Fifth year | 17.9 (Poor) 24.7 (Moderate) 57.3 (Good) | 16.2 (Poor) 24.3 (Moderate) 59.5 (Good) | | |
| Q-4 | Fourth year | 36.5 (Poor) 26.8 (Moderate) 36.8 (Good) | 41.1 (Poor) 37.9 (Moderate) 21.0 (Good) | 2.69 ± 0.97 | Moderate |
| | Fifth year | 30.9 (Poor) 43.8 (Moderate) 25.3 (Good) | 22.6 (Poor) 40.2 (Moderate) 37.2 (Good) | | |
| Q-5 | Fourth year | 62.8 (Poor) 22.1 (Moderate) 15.0 (Good) | 53.3 (Poor) 30.8 (Moderate) 15.9 (Good) | 2.39 ± 1.04 | Moderate |
| | Fifth year | 29.9 (Poor) 38.2 (Moderate) 21.9 (Good) | 32.7 (Poor) 36.5 (Moderate) 30.8 (Good) | | |
| Q-6 | Fourth year | 64.6 (Poor) 24.6 (Moderate) 10.8 (Good) | 63.9 (Poor) 27.5 (Moderate) 8.6 (Good) | 2.19 ± 0.97 | Poor |
| | Fifth year | 68.0 (Poor) 24.2 (Moderate) 7.8 (Good) | 45.9 (Poor) 39.2 (Moderate) 14.9 (Good) | | |
| Q-7 | Fourth year | 87.9 (Poor) 8.9 (Moderate) 3.2 (Good) | 74.8 (Poor) 8.1 (Moderate) 7.1 (Good) | 1.55 ± 0.9 | Poor |
| | Fifth year | 87.7 (Poor) 10.1 (Moderate) 2.3 (Good) | 65.2 (Poor) 23.0 (Moderate) 11.8 (Good) | | |
| Q-8 | Fourth year | 52.5 (Poor) 35.0 (Moderate) 12.5 (Good) | 53.3 (Poor) 30.8 (Moderate) 15.9 (Good) | 2.43 ± 0.96 | Moderate |
| | Fifth year | 48.4 (Poor) 36.0 (Moderate) 15.7 (Good) | 32.1 (Poor) 39.9 (Moderate) 28.1 (Good) | | |

| SECTION 2 | | | | | |
|------------------|-----------------|-----------------|-----------------|-------------|----------|
| Q-9 | Fourth year | 20.1 (Poor) | 24.8 (Poor) | 3,35 ± 1,09 | Moderate |
| | | 29.6 (Moderate) | 26.3 (Moderate) | | |
| | | 50.3 (Good) | 49.1 (Good) | | |
| Fifth year | 10.7 (Poor) | 8.8 (Poor) | 3,77 ± 0,97 | Good | |
| | 31.5 (Moderate) | 23.3 (Moderate) | | | |
| | 57.8 (Good) | 67.9 (Good) | | | |
| Q-10 | Fourth year | 36.1 (Poor) | 32.1 (Poor) | 2,97 ± 1,07 | Moderate |
| | | 31.1 (Moderate) | 36.4 (Moderate) | | |
| | | 32.9 (Good) | 31.5 (Good) | | |
| Fifth year | 28.1 (Poor) | 15.8 (Poor) | 3,36 ± 1,05 | Moderate | |
| | 35.4 (Moderate) | 30.4 (Moderate) | | | |
| | 36.5 (Good) | 53.8 (Good) | | | |
| Q-11 | Fourth year | 47.5 (Poor) | 40,9 (Poor) | 2,67 ± 1,08 | Moderate |
| | | 30.7 (Moderate) | 36,1 (Moderate) | | |
| | | 21.8 (Good) | 23.0 (Good) | | |
| Fifth year | 37.1 (Poor) | 17.6 (Poor) | 3,13 ± 1,02 | Moderate | |
| | 39.3 (Moderate) | 35.8 (Moderate) | | | |
| | 23.6 (Good) | 46.6 (Good) | | | |
| SECTION 3 | | | | | |
| Q-12 | Fourth year | 11.1 (Poor) | 12.6 (Poor) | 3,64 ± 0,93 | Moderate |
| | | 23.2 (Moderate) | 24.5 (Moderate) | | |
| | | 65.7 (Good) | 62.9 (Good) | | |
| Fifth year | 7.3 (Poor) | 5.8 (Poor) | 3,83 ± 0,85 | Good | |
| | 27.0 (Moderate) | 19.3 (Moderate) | | | |
| | 65.7 (Good) | 74.9 (Good) | | | |
| Q-13 | Fourth year | 7.8 (Poor) | 15.4 (Poor) | 3,61 ± 0,95 | Moderate |
| | | 26.1 (Moderate) | 28.5 (Moderate) | | |
| | | 66.1 (Good) | 56.1 (Good) | | |
| Fifth year | 5.7 (Poor) | 6.4 (Poor) | 3,97 ± 0,84 | Good | |
| | 21.3 (Moderate) | 13.5 (Moderate) | | | |
| | 73.0 (Good) | 80.1 (Good) | | | |
| Q-14 | Fourth year | 11.4 (Poor) | 19.1 (Poor) | 3,49 ± 0,98 | Moderate |
| | | 27.1 (Moderate) | 28.0 (Moderate) | | |
| | | 61.5 (Good) | 52.9 (Good) | | |
| Fifth year | 7.3 (Poor) | 5.8 (Poor) | 3,87 ± 0,87 | Good | |
| | 27.5 (Moderate) | 17.6 (Moderate) | | | |
| | 65.2 (Good) | 66.6 (Good) | | | |
| Q-15 | Fourth year | 32.9 (Poor) | 36.1 (Poor) | 2,94 ± 1,08 | Moderate |
| | | 35.7 (Moderate) | 30.6 (Moderate) | | |
| | | 31.4 (Good) | 33.3 (Good) | | |
| Fifth year | 24.7 (Poor) | 18.2 (Poor) | 3,27 ± 1 | Moderate | |
| | 38.8 (Moderate) | 36.5 (Moderate) | | | |
| | 36.5 (Good) | 45.3 (Good) | | | |
| TOTAL | Fourth year | 5.0 (Poor) | 22.7 (Poor) | 3,09 ± 0,78 | Moderate |
| | | 62.5 (Moderate) | 67.9 (Moderate) | | |
| | | 32.5 (Good) | 9.3 (Good) | | |
| Fifth year | 13.5 (Poor) | 28.4 (Poor) | 3,54 ± 0,73 | Moderate | |
| | 74.7 (Moderate) | 59.8 (Moderate) | | | |
| | 11.8 (Good) | 11.8 (Good) | | | |

DISCUSSION

Dental students get training in basic, internal, and surgical medical sciences. Since they have intensive preclinical and clinical dental training, they do not study pathology, physiology, or other basic medical sciences to the same extent as do medical students.⁴ Therefore, topics regarding medical sciences are taught in oral and maxillofacial surgery lessons and internships. The

knowledge of bleeding mechanism and the management of bleeding problems are among the most important topics. Dentists must be aware of bleeding disorders, drugs these patients use, normal laboratory values of these patients, and materials and equipment necessary to stop abnormal bleeding.⁵

Whether to use anticoagulants before dental treatment is still controversial. In a study conducted on educators

in the USA, it was recommended that the anticoagulant regimen be modified in consultation with a relevant medical doctor even before the simplest dental procedure.⁶ In a study by Martínez-Beneyto et al., students believed that oral anticoagulant treatment should be continued before a simple extraction according to the education given in Spain.⁴ However, it was reported that single or multiple tooth extractions of patients using warfarin, whose international normalized ratio (INR) was 2–4, could be performed without any major complications.⁷ Regarding their knowledge of anticoagulants, fourth-year dental students rated themselves as "moderate" but fifth-year dental students rated themselves as "good" and showed that they had self-confidence. Shah et al. found that 53% dentists were aware of mandatory laboratory test before dental treatment for patients who used anticoagulants in their study among dentists.⁸ In present study, knowledge of laboratory tests was determined as moderate in the both groups. These findings showed that the scope of the curriculum on laboratory tests should be expanded.

Zanon et al. performed single and multiple tooth extractions in their study of patients using warfarin. No significant differences in bleeding were seen based on different INR values from 1.8 to 4.0. This study and similar studies supported that single and multiple extractions could be performed by taking only local hemostatic measures without any intervention in anticoagulation therapy.^{9, 10} American College of Chest Physicians Evidence-Based Clinical Practice Guidelines recommend that continue oral antithrombotic and vitamin antagonist medications with oral hemostatic agents before and during dental procedures.¹¹ Wahl also supported this view by reporting five serious thromboembolic cases (including four deaths) in which anticoagulation therapy was stopped prior to dental procedures.¹² The use of local hemostatic measures, gelatin sponges and silk sutures, tranexamic acid-soaked gauze, tranexamic acid mouthwash, oxidized regenerated cellulose, histoacryl glue, fibrin glue, plasma gel, and so forth, has gained importance recently.⁶ In the present study, dentistry students were asked to evaluate their knowledge of hemostatic agents; it was observed that the students rated themselves as "moderate." Kumar et al. found that, in their study, 60% of dental students were aware of using sponge in postoperative bleeding consistent with this study.¹³

The most remarkable result related to questions on bleeding interventions was seen in the efficient use of electrocautery by students. The average of all students, regardless of sex or class, indicated that they did not find themselves capable enough in using electrocautery in bleeding control. This might be because they did not encounter a bleeding case requiring the use of electrocautery during the internship. A simulation lab where students can practice electrocautery or attend courses/workshops may increase their competence in

using electrocautery. Flanagan et al. expressed that the contribution of simulation training in health education is valuable.¹⁴

This study involved surveys for students who received their theoretical education and completed their internship, which allowed determining the value of their theoretical training and internship. However, this survey was not planned to measure their knowledge; students evaluated themselves in this study. Davis et al. reported that doctors had limited ability to accurately self-assess.¹⁵ On the contrary, recent studies found a high correlation between self-assessment of knowledge and actual knowledge.¹⁶⁻¹⁸

Sex may be a potential factor affecting self-assessment.¹⁹ A meta-analysis on self-assessments of medical students reported that female students tended to underestimate and male students tended to overestimate their performance.²⁰ In the present study, as in previous studies, male students scored themselves higher compared with female students.

This study had several limitations. First, multiple-choice, or true/false questions could be asked to measure students' explicit knowledge. However, it was a multi-centered study, and some students received the questionnaire as Google forms. These students could always get help from their friends, books, or the Internet to complete the questionnaire. Second, the questionnaire included questions about the experience of students such as "Have you had any experience with the hemostatic agent before?" Third, the curriculum in Turkey had minor differences, which might have affected the results. However, ensuring standardization might not be possible. Finally, applying this survey to postgraduate students and dentists might be beneficial for the effectiveness and sustainability of training programs. Further investigation is needed in this regard.

CONCLUSIONS

This study showed that fifth-year students were at a better level of competence in bleeding intervention and knowledge of hemostatic agents and anticoagulants. Also, dental students' ability and knowledge of bleeding, hemostatic agents, and anticoagulants were at a desirable level. The ways to distinguish the source of bleeding can be emphasized in the lessons. Students were found to be less confident in arterial bleeding. In addition, while students express themselves better in terms of knowledge level, they have slightly lower scores on intervention. In addition, regardless of the group, the ability to use electrocautery was poor in all the students. Practical applications were useful to improve this using electrocautery.

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