

# Evaluation of knowledge levels of Turkish dental students on maxillofacial trauma assessment in 2020

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## Abstract

**Background:** This study aimed to evaluate the level of theoretical and practical knowledge of the fourth- and fifth-year dental students in the examination of maxillofacial trauma patients.

**Methods:** A questionnaire consisting of 20 questions measured on a Likert scale, was designed to evaluate the knowledge level of the students about maxillofacial trauma. The survey questions were transferred to Google Forms. The questionnaire was delivered to the students electronically through the Turkish Dental Association. Survey responses submitted between September 1, 2020 and November 1, 2020 were included.

**Results:** The study included 660 dentistry students, among whom 420 were in the fifth and 240 were in the fourth year. Participants were asked 13 questions under the heading “Which of the following is/are appropriate for emergency assessment of a conscious patient presenting with maxillofacial trauma?” While 10 questions were answered correctly by the majority of the students, 3 questions were answered incorrectly. Additionally, negative responses were found to be higher for the seven subjective questions asked to evaluate students’ clinical experience.

**Conclusion:** This study found that the dentistry students had an acceptable degree of theoretical knowledge about maxillofacial trauma, but they lacked clinical experience. Therefore, in undergraduate dental education, theoretical training should be coupled with proper practical training in patient examination, diagnostics, and treatment.

**Keywords:** Dental student, Knowledge, Maxillofacial trauma

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## Introduction

Maxillofacial trauma is an important health problem commonly encountered in the emergency room.<sup>1</sup> Its etiology includes traffic accidents, occupational accidents, physical assault, sports accidents, and falls.<sup>2</sup> Initial assessment and evaluation of patients with maxillofacial trauma include the examination of the vital signs. After the initial evaluation, procedures are performed for the diagnosis and treatment of respiratory and circulatory problems.<sup>3</sup> After the patient’s vital functions are stabilized, dentists move on to the next stages of examination and diagnosis for the management of the injured area.<sup>4</sup>

A dentist is required to have the necessary knowledge and skills to establish a correct diagnosis and develop an appropriate treatment plan for patients with maxillofacial trauma. To ensure this, dental students should be offered the necessary theoretical knowledge as part of their undergraduate curriculum, and this knowledge should be supported by clinical practice. Effective feedback methods are imperative to assess the knowledge and practical experience that dental students gain in classes and subsequently improve the undergraduate curriculum.<sup>5,6</sup> When assessed correctly, data obtained from such methods will help educational institutions improve their

approach to training students according to their strengths and shortcomings.

This study aimed to evaluate the level of theoretical and practical knowledge of the fourth- and fifth-year dental students in the examination of patients with maxillofacial trauma.

## Methods

The cross-sectional study was conducted on fourth- and fifth-year dentistry students who volunteered to participate in the study. The survey and informed consent form we used in the study was delivered online to fourth- and fifth-year dental students registered with the Turkish Dental Association. The questionnaire was designed to determine the basic concepts of maxillofacial trauma examination, emergency intervention, and follow-up procedures and to assess the students’ level of knowledge regarding these issues.

The first part of the questionnaire focuses on students’ age, sex, and study year. The second part comprises 20 questions measured on a Likert scale, to assess the students’ level of knowledge about managing maxillofacial traumas. The survey was created with reference to the study by Saruhan et al<sup>7</sup> on the subject. Saruhan et al<sup>7</sup> designed the



questionnaire based on *Tintinalli's Emergency Medicine: A Comprehensive Study Guide, 8th Edition, 2004*.<sup>8</sup>

Students were informed that participation was voluntary and anonymous. An informed consent form was obtained from all participants. Survey questions were sent to students in Google Forms. The questions were sent to students via the Turkish Dental Association to be filled out by the students. Survey responses submitted between September 1, 2020 and November 1, 2020 were included. To avoid conflict of interest, participants were instructed not to reveal their universities. The primary goal was to collect as much data on the subject as possible to improve dental education.

### Statistical analysis

IBM SPSS Version 25.0 (Armonk, NY: IBM Corp) was used for all statistical analyses. Regarding the data, in addition to frequency and percentage distributions, the relationship between categorical variables was analyzed using the chi-square test. *P* values under 0.05 were considered statistically significant.

### Results

We included 660 dentistry students, 242 men (36.7%) and 418 women (63.3%), among whom 420 (63.6%) were in the fifth and 240 (36.4%) were in the fourth year. Participants' age ranged from 20 to 29 years with a mean of  $23.08 \pm 1.24$  years (Table 1). Participants were asked 13 questions under the heading "Which of the following is/are appropriate for emergency assessment of a conscious patient presenting with maxillofacial trauma?" The questions, the correct responses, and the students' responses are summarized in Table 2. The highest rate of correct responses was given to the following items: "Facial asymmetry should be checked" (98.9%), "The airway should be checked" (96.7%), "Change in patient's occlusion should be asked" (96.2%), "It is enough to make a frontal facial assessment" (95.6%), and "Numbness on patient's face should be checked" (93.8%).

The lowest rate of correct responses was given to the following items: "Radiographic assessment is required before physical examination" (24.7%), "Check for maxillary mobility for suspected Le Fort fracture; however, the examination cannot establish the exact type of Le Fort fracture" (26.5%), "Pre-trauma dental pain should be asked" (31.8%), and "Time since the last meal should be asked" (46.4%). In the item "Check for maxillary mobility for suspected Le Fort fracture, however, the examination

cannot establish the exact type of Le Fort fracture," 13.3% of the fourth-year students and 34% of fifth-year students responded "No," which was the correct answer. A statistically significant difference was also observed between the groups ( $P < 0.01$ ).

The study also included seven subjective questions to evaluate the students' clinical experience. The students' responses are presented in Table 3. Overall, 20% of the fourth-year students and 40.5% of the fifth-year students responded "Yes" to the question, "Have you ever come across a maxillofacial trauma?" whereas 35% of the fourth-year students and 53.8% of the fifth-year students answered "Yes" to the question, "Do you think you can diagnose a condyle fracture on clinical examination?" Furthermore, 12.5% of the fourth-year students and 24.8% of the fifth-year students answered "Yes" to the question "Do you think you have sufficient knowledge about inter-maxillary fixation?," and 28% of the fourth-year students and 41.6% of the fifth-year students answered "Yes" to the question "Do you think you can make the correct diagnosis for patients with dental and maxillofacial trauma?" A statistically significant difference was also observed between the groups in these questions ( $P < 0.01$ ).

### Discussion

The maxillofacial area is involved in both chewing and speech and also serves aesthetic purposes. Therefore, the approach towards the trauma patient at initial examination and correct diagnosis are of great importance.<sup>4</sup> The basic maxillofacial trauma training in dentistry aims to give dental students the necessary level of knowledge and practical skills to make a correct pre-diagnosis and provide guidance in maxillofacial trauma cases. According to the results of the present study, although the responses given to the objective questions were acceptable, the answers to the subjective questions show that the knowledge of the students is inadequate in terms of diagnosis and treatment of maxillofacial trauma. This also demonstrates that despite the sufficient theoretical education on maxillofacial trauma, students lack clinical experience. When the answers to subjective questions were examined in the studies of Saruhan et al,<sup>7</sup> it was observed that physicians stated that the experience was not sufficient for both diagnosis and treatment. These results were attributed to the high level of hesitation in making a diagnosis due to the low rate of exposure to maxillofacial trauma, even if the quality of the theoretical education provided in dentistry faculties was sufficient. We observed that the fifth-year students provided positive answers to subjective questions significantly more frequently than the fourth-year students. This can be related to the fact that the fifth-year students participating in the study were more familiar with clinical cases than the fourth-year students. In the studies of Saruhan et al,<sup>7</sup> it was observed that the knowledge level of graduate dentists was higher

**Table 1.** Demographic characteristics of the participants

		Fourth-year	Fifth-year	Total
Gender	Men	101 (41.73%)	141 (58.26%)	242
	Women	139 (33.25%)	279 (66.74%)	418
Mean age		$22.45 \pm 1.07$	$23.45 \pm 1.19$	$23.08 \pm 1.24$

**Table 2.** The checklist, the correct responses and the students' responses

Which of the following is/are appropriate for emergency assessment of a conscious patient presenting with maxillofacial trauma?						
	Correct response	Students' responses	Total	Fourth-year	Fifth-year	P
Airway should be checked.	Yes	Yes	96.7%	95.8%	97.1%	0.492
		No	2.3%	2.5%	2.1%	
		No information	1.1%	1.6%	0.7%	
The patient should be tested for vision loss.	Yes	Yes	85.5%	84.6%	86%	0.190
		No	3.8%	2.5%	4.5%	
		No information	10.8%	12.9%	9.5%	
Numbness on patient's face should be checked.	Yes	Yes	93.8%	95%	93%	0.031*
		No	2.4%	0.4%	3.5%	
		No information	3.8%	4.5%	3.3%	
Time since the last meal should be asked.	Yes	Yes	46.4%	48.3%	45.2%	0.644
		No	21.4%	19.5%	22.3%	
		No information	32.3%	32%	32.3%	
Pre-trauma dental pain should be asked.	No	Yes	48.5%	50.4%	47.3%	0.166
		No	31.8%	27.5%	34.2%	
		No information	19.7%	22%	18.3%	
Change in patient's occlusion should be asked.	Yes	Yes	96.2%	94.1%	97.3%	0.950
		No	0.9%	1.6%	0.4%	
		No information	2.9%	4.1%	2.1%	
Radiographic assessment is required before physical examination.	No	Yes	70.9%	72%	70.2%	0.042*
		No	24.7%	21.2%	26.6%	
		No information	4.4%	6.6%	3%	
Facial asymmetry should be checked.	Yes	Yes	98.9%	99.1%	98.9%	0.690
		No	0.3%	0.4%	0.2%	
		No information	0.8%	0.4%	0.9%	
It is enough to make a frontal facial assessment.	No	Yes	2.9%	2.5%	3%	0.270
		No	95.6%	95%	96%	
		No information	1.5%	2.5%	1%	
All facial bones inside and outside the injured area should be manually examined.	Yes	Yes	71.4%	68.3%	73%	0.282
		No	15.5%	15.8%	15.2%	
		No information	13.2%	15.8%	11.6%	
Foreign objects and broken tooth fragments should be removed.	Yes	Yes	85.9%	87%	85.2%	0.227
		No	6.2%	4.1%	7.3%	
		No information	7.9%	8.7%	7.3%	
Check for maxillary mobility for suspected Le Fort fracture, however, the examination cannot establish the exact type of Le Fort fracture.	No	Yes	42.7%	35.8%	46.6%	<0.001*
		No	26.5%	13.3%	34%	
		No information	30.8%	50.8%	19.2%	
Long-term follow-up should be performed even if there is no immediate complaint after trauma to the joint area.	Yes	Yes	91.1%	89.1%	92.1%	0.433
		No	2.1%	2.5%	1.9%	
		No information	6.8%	8.3%	6%	

Chi-square test,  $P < 0.05$  statistically significant ( $P$ : statistical difference between fourth-year and fifth-year students)

in each question than the fifth-year students.

The item with the lowest correct response rate was "Radiographic assessment should be made before patient examination." According to the guidelines in *Tintinalli's Emergency Medicine: A Comprehensive Study Guide*<sup>8</sup>, radiographic assessment of the patient should be made

after the physical examination because a fast and accurate clinical examination is a priority in maxillofacial traumas. Another item with a low correct response rate was the item "Check for maxillary mobility for suspected Le Fort fracture; however, the examination cannot establish the exact type of Le Fort fracture." This may be attributed to

**Table 3.** Subjective questions and students' responses

		Total	Fourth-year	Fifth-year	P
Have you ever come across a maxillofacial trauma?	Yes	33%	20%	40.5%	<0.001*
	No	67%	80%	59.5%	
Do you think you can diagnose a condyle fracture on clinical examination?	Yes	47%	35%	53.8%	<0.001*
	No	53%	65%	46.2%	
Do you think you have sufficient knowledge about inter-maxillary fixation?	Yes	20.3%	12.5%	24.8%	<0.001*
	No	79.7%	87.5%	75.2%	
Do you think you are knowledgeable enough about the Barton bandage?	Yes	12.6%	13.4%	12.2%	0.657
	No	87.4%	86.6%	87.8%	
Do you think you can handle a dental trauma if you ever encounter one?	Yes	33.6%	31.6%	34.7%	0.418
	No	66.4%	68.4%	65.3%	
Do you think you can make the correct diagnosis for patients with dental and maxillofacial trauma?	Yes	36.7%	28%	41.6%	<0.001*
	No	63.3%	72%	58.4%	
Do you think you can handle a maxillofacial trauma if you ever encounter one?	Yes	10.8%	8.7%	12%	0.208
	No	89.2%	91.3%	88%	

Chi-square test,  $P < 0.05$  statistically significant ( $P$ : statistical difference between fourth-year and fifth-year students).

the relatively low clinical incidence of Le Fort fractures. Yet another item with a low correct response rate was "Time since the last meal should be asked." According to the same guideline, this information is crucial when examining the patient to make quick decisions in cases where sedation and general anesthesia may be required.<sup>8</sup>

Previous studies have investigated dental students' level of knowledge on dental trauma and showed that students were insufficiently educated in dental trauma management.<sup>9,10</sup> In the study conducted by Özmen et al<sup>11</sup> to evaluate dental trauma knowledge of dentistry students, it was reported that 80.1% of the students had insufficient knowledge. In the study of Eden et al,<sup>12</sup> in which they evaluated the approach of senior medical students about dental trauma, it was reported that the students' knowledge about dental trauma was insufficient. In the studies conducted by Alyasi et al<sup>13</sup> in United Arab Emirates, Zaleckienė et al<sup>14</sup> in Lithuania, De Franca et al<sup>15</sup> in Brazil, and Kostopoulou and Duggal<sup>16</sup> in England, the knowledge level of dentists was found to be insufficient. In the studies conducted by Buldur and Kapdan<sup>17</sup> and Aydınoglu et al<sup>18</sup> in Turkey, Akhlaghi et al<sup>19</sup> in Iran, and Yeng and Parashos<sup>20</sup> in Australia, it was determined that dentists had a moderate level of dental trauma knowledge. Based on these studies, it is evident that theoretical training on dental and maxillofacial traumas should be supported by practical application and clinical experience.

This study has some limitations. The survey was based on a non-validated, self-designed questionnaire. The survey we used in the study was delivered only to fourth- and fifth-year dental students registered with the Turkish Dental Association. Owing to the fact that there are students who have not participated in the study, the results cannot be generalized. Moreover, as feedback surveys may lead participants to give socially acceptable responses, the answers given to the questionnaire may not fully reflect

the students' real knowledge and daily professional practice. Despite these limitations, the present study has collected important information on dental students' level of knowledge and practical experience related to maxillofacial trauma in Turkey. Similar studies with larger sample sizes should be conducted on this topic in the future.

### Conclusion

This study found that dentistry students possessed an acceptable level of theoretical knowledge about maxillofacial trauma, but they lacked clinical experience. Therefore, in undergraduate dental education, theoretical training in patient examination, diagnoses, and treatment should be supported with proper clinical practice, and an educational strategy should be planned accordingly. In addition, it should be ensured that students make more clinical observations in clinical trauma cases.

### Authors' Contribution

**Conceptualization:** Merve Sari.

**Data curation:** Merve Sari.

**Formal analysis:** Merve Sari.

**Funding acquisition:** Merve Sari.

**Investigation:** Merve Sari.

**Methodology:** Merve Sari.

**Project administration:** Merve Sari.

**Resources:** Merve Sari.

**Supervision:** Merve Sari.

**Validation:** Merve Sari.

**Visualization:** Merve Sari.

**Writing—original draft:** Merve Sari.

**Writing—review & editing:** Merve Sari.

### Competing Interests

There are no conflicts of interest.

**Ethical Approval**

The study was approved by the Ethics Committee of Tokat Gaziosmanpasa University (Date: August 27, 2020, Meeting number: 2020/11, Project number: 20-KAEK-223).

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