

# Familiarity and awareness of facial cosmetic and oral maxillofacial surgery among dental and medical undergraduate students: Multicentre cross-sectional study

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## RESEARCH

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## ABSTRACT

### Background

Facial cosmetic and oral maxillofacial Surgery (OMFS) is primarily a surgical specialty of dentistry concerned with the management of diseases of the jaws, mouth, face and neck regions. It is indeed common knowledge that many medical professionals and the public have a very low awareness of OMFS.

### Aims

This multicentric study aimed to investigate and check the familiarity and awareness of facial cosmetic and OMFS among dental and medical undergraduate students in Jeddah, Saudi Arabia.

### Methods

This cross-sectional study was distributed among medical and dental undergraduate students of different universities in Saudi Arabia, between September and December, 2019. The questionnaire consisted of 23 variables that were divided into 2 sections: (a) demographic information (b) facial cosmetic and OMFS questions. Ethical approval was granted by the Research Ethics Committee. All analyses were performed using SPSS, version 24.

### Results

Total of 412 dentistry students and 452 medicine & surgery students included. A much higher percentage of dental students (80.6 per cent) have heard about Facial cosmetic and,  $p < 0.001$ . Among the specific Facial Cosmetic & OMFS, 'fractures of the jaw and face' was known by most of the dental (77.7 per cent) and medical (63.7 per cent) students. The mean awareness score was higher among the dentistry students compared to medicine & surgery students ( $8.88 \pm 4.47$  vs.  $8.78 \pm 4.40$  out of 17).

### Conclusion

Level of Familiarity and awareness was reasonable. This study ascertains the need for an effective educational program to increase the awareness.

### Key Words

Awareness, facial cosmetic, students

### What this study adds:

#### 1. What is known about this subject?

There is inadequate information in the literature on the level of awareness towards facial cosmetic and OMFS among undergraduate dental and medical students.

## 2. What new information is offered in this study?

Small number of undergraduate medical and dental students knew about the scope of facial cosmetic and OMFS.

## 3. What are the implications for research, policy, or practice?

This study ascertains the need for an effective educational program to increase the awareness, which will enhance the ideal management being delivered to our patients.

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## Background

Oral and maxillofacial surgery (OMFS) is primarily a surgical specialty of dentistry concerned with the management of diseases of the jaws, mouth, face, and neck regions.<sup>1</sup> The scope of oral and maxillofacial surgeon is not limited to diseases of the teeth as is the common belief. OMFS is a vast field concerned with the treatment of diseases, injuries, and/or defects in the head, neck, jaws, face, and/or hard and soft tissues of the oral and maxillofacial regions. It includes facial cosmetic surgery, orthognathic surgery, cleft lip and palate surgery, head and neck cancer surgery, and facial trauma and reconstructive surgery.<sup>2</sup> OMFS is an internationally recognized surgical specialty. It is considered a branch of dentistry in countries such as the United States; because in the United Kingdom, it is considered a medical specialty.<sup>3</sup> Oral and maxillofacial surgeons examine and treat dental and medical emergency cases; they also receive referrals from professionals within these specialties. OMFS is one of the few branches of dentistry that is linked to and interacts with other medical specialties.<sup>4</sup> However, the general population and even medical professionals have low awareness about the scope of the branch of OMFS.<sup>5</sup> Ifeacho et al. demonstrated in their research conducted between 1995 and 2005 that people had limited information about the specialty of OMFS.<sup>6</sup> Even dentists and physicians are sometimes confused about the specialty to which, cases related to jaws and face (otorhinolaryngologist, plastic and/or cosmetic surgeons, periodontists, and/or maxillofacial surgeons) should be referred.<sup>7</sup> Surveys conducted among undergraduate medical students show that these students have limited exposure to facial cosmetic and OMFS and are not aware of the future prospects in this field.<sup>8-10</sup> A study conducted by Hunter et al.<sup>11</sup> showed that there is a lack of knowledge about OMFS among health professionals, students, and the general population, and few individuals understand the complete scope of the specialty. The study attributed this lack of knowledge to the lack of media publicity and the fact that it is a branch of dentistry, and not medicine. A dental professional should be aware of the spectrum of cases that an oral and

maxillofacial surgeon can treat while referring a patient to a specialist. A general awareness among medical practitioners regarding oral health and relationship between systemic and oral health is required. Considering the significant progress in the field of OMFS, increasing the awareness among medical and dental students as well as the general population regarding various OMFS is essential.<sup>11-13</sup> Therefore, this multicentric study was conducted to investigate and assess the familiarity and awareness of facial cosmetic and oral maxillofacial surgery among dental and medical undergraduate students in Jeddah, Saudi Arabia.

## Method

### Study design and data collection

This cross-sectional study was distributed between September 2019 and December 2019 using an online self-administered questionnaire. The authors had a master list of students' names and their contact information. Participants were chosen via a multistage stratified random sampling method. Stratification considered college and educational year. The sample size was calculated by Raosoft® online sample calculator with the margin of error 5 per cent, and confidence level of 95 per cent and therefore, the recommended sample size was calculated to be 750. A total of 864 undergraduate students (2nd to 6th year) from seven different colleges and universities (AlFarabi College, Batterjee Medical College, Ibn Sina National College for Medical Studies, Jeddah University, King Abdulaziz University, King Saud Bin AbdulAziz University for Health Sciences, Umm Al-Qura University) in the Makkah region of Saudi Arabia.

### Study variables

Before starting the data collection, we conducted a pilot study using the questionnaire among 50 team members including undergraduate dental and medical students as well as academics and epidemiologists at our institute to assess the validity, clarity, and sequence of the questions. Data was collected through the survey, which required approximately three minutes to be completed. The questionnaire consisted of 23 questions divided into 2 sections: (a) demographic information including age, gender, specialty, university, educational level, grade point average (GPA), and previous exposure to a surgical discipline (b) questions related to facial cosmetic and maxillofacial surgery. The mean overall score of awareness in our study was 14 and ranged between 1 and 17; a higher score indicated better familiarity and more awareness regarding facial cosmetic and maxillofacial surgeries.

**Ethical considerations**

The study was conducted after ethical approval by the research ethics committee of King Abdulaziz University, Jeddah, Saudi Arabia. Students participated in this study on a voluntary basis.

**Statistical analysis**

All the obtained data were verified to be complete, and errors were corrected. Categorical data are presented as frequencies and percentages. Continuous data are presented as mean ± standard deviation. Association between questions related to facial cosmetic and oral maxillofacial surgery and specialty of the students taking the survey was analysed by the chi-square test. The awareness scores of medical and dental students were calculated by adding the number of correct responses to questions 12, 13, 14, 17, and 18. The normalcy of the scores was determined by the Kolmogorov-Smirnov test and the Shapiro-Wilk test. The awareness scores of medical and dental students were compared using the Mann-Whitney U test. The chi-square test was used to determine the association between specialty and baseline characteristics. The analysis was performed in 95 per cent confidence interval using the statistical package for social science (SPSS) version 24.0 (IBM, Armonk, NY, USA).

**Results**

Altogether, 412 dental and 452 medical students from the 7 colleges/universities were included in this study. Males dominated the study in number [544 (63.0 per cent)]. Majority of the students were Saudi nationals [762 (88.2 per cent)] (Table 1).

**Table 1: Socio-demographic characteristics of all respondents (n=864)**

Characteristics	N	%
<b>Gender</b>		
Female	320	37.0
Male	544	63.0
<b>Nationality</b>		
Non-Saudi	102	11.8
Saudi	762	88.2
<b>Educational institute</b>		
AlFarabi College	36	4.2
Batterjee Medical College	22	2.5
Ibn Sina National College for Medical Studies	354	41.0
Jeddah University	8	0.9

King Abdulaziz University	258	29.9
King Saud Bin AbdulAziz University for Health Sciences	122	14.1
Umm Al-Qura University	64	7.4
<b>Specialty</b>		
Dentistry	412	47.7
Medicine and surgery	452	52.3
<b>Undergraduate year</b>		
2nd year	18	2.1
3rd year	234	27.1
4th year	120	13.9
5th year	106	12.3
6th year	386	44.7
<b>Academic GPA</b>		
<2.5	20	2.3
2.5 – 2.99	34	3.9
3-3.49	82	9.5
3.5 - 3.99	186	21.5
4-4.49	254	29.4
4.5-5	288	33.3

GPA: Grade point average

The sociodemographic characteristics of dental and medical students are presented separately in Table 2.

**Table 2: Baseline characteristics of the respondents by specialty**

Characteristics	Dentistry (n=412)		Medicine and surgery (n=452)	
	N	%	N	%
<b>Gender</b>				
Female	184	44.7	136	30.1
Male	228	55.3	316	69.9
<b>Nationality</b>				
Non-Saudi	52	12.6	50	11.1
Saudi	360	87.4	402	88.9
<b>University</b>				
AlFarabi College	30	7.3	6	1.3
Batterjee Medical College	6	1.5	16	3.5
Ibn Sina National College for Medical Studies	172	41.7	182	40.3
Jeddah University	2	0.5	6	1.3

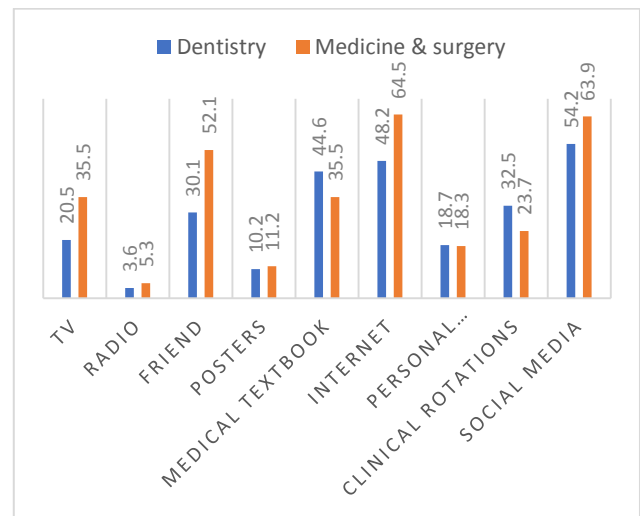
King Abdulaziz University	146	35.4	112	24.8
King Saud Bin AbdulAziz University for Health Sciences	2	0.5	120	26.5
Umm Al-Qura University	54	13.1	10	2.2
Undergraduate year				
2nd year	8	1.9	10	2.2
3rd year	118	28.6	116	25.7
4th year	58	14.1	62	13.7
5th year	48	11.7	58	12.8
6th year	180	43.7	206	45.6
Academic GPA				
<2.5	14	3.4	6	1.3
2.5-2.99	16	3.9	18	4.0
3-3.49	40	9.7	42	9.3
3.5-3.99	100	24.3	86	19.0
4-4.49	146	35.4	108	23.9
4.5-5	96	23.3	192	42.5

GPA: Grade point average

Approximately 36 per cent dental and 35 per cent medical students were previously exposed to rotation duties in various surgical specialties. A significantly higher percentage of dental students (80.6 per cent) had knowledge regarding facial cosmetic and oral maxillofacial surgery compared to their medical students peers (74.8 per cent),  $p < 0.001$ . Additionally, higher percentage of dental students knew the risks associated with facial cosmetic surgeries compared to medical students (47.6 per cent vs. 31.0 per cent),  $p < 0.001$ . However, higher percentage of medical students thought that facial cosmetic surgeries are necessary (71.7 per cent),  $p < 0.001$ . Significantly increased numbers of dental students aspired to become facial cosmetic and maxillofacial surgeons (39.3 per cent) than medical students (12.8 per cent),  $p < 0.001$  (Table 3).

The most common source of information regarding facial cosmetic and oral maxillofacial surgery for dental students was 'social media' (54.2 per cent) followed by 'internet' (48.2 per cent), while that for medical students was 'internet' (64.5 per cent) followed by 'social media' (63.9 per cent). 'Radio' was the least common source of information for both the specialties (Figure 1).

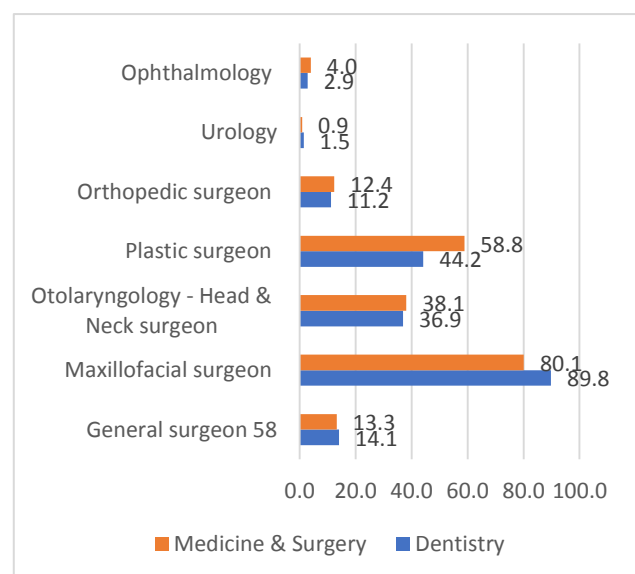
**Figure 1: Distribution of source of information about facial cosmetic and oral maxillofacial surgery in dental (n=332) and medical and surgery (n=338) students**



\*Values are presented in percentages

Among the 332 dental students who had knowledge regarding facial cosmetic and maxillofacial surgery, 59.7 per cent believed the information was reliable. In case of medical students, 45.1 per cent believed the information was reliable. Approximately 80 per cent medical students and 90 per cent dental students were aware that maxillofacial surgeons perform some facial cosmetic surgeries (Figure 2).

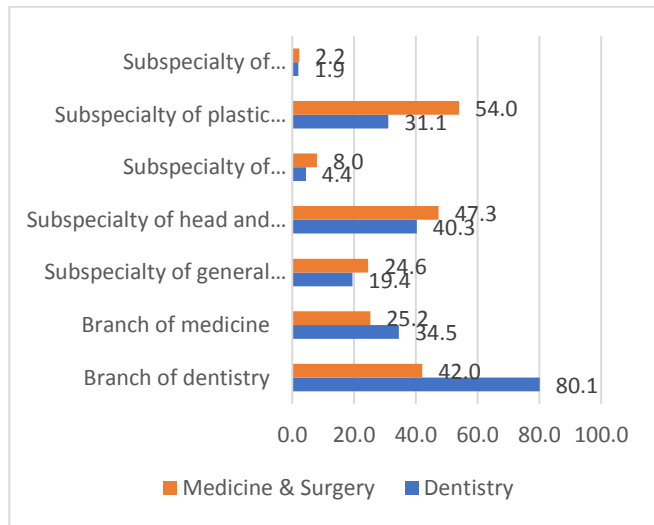
**Figure 2: Distribution of their familiarity of the discipline to which facial cosmetic surgery belongs among dental (n=332) and medical and surgery (n=338) students**



\*Values are presented in percentages

Most dental students knew that oral maxillofacial surgery is a branch of dentistry, but relatively fewer medical students (42.0 per cent) knew it to be a branch of dentistry (Figure 3).

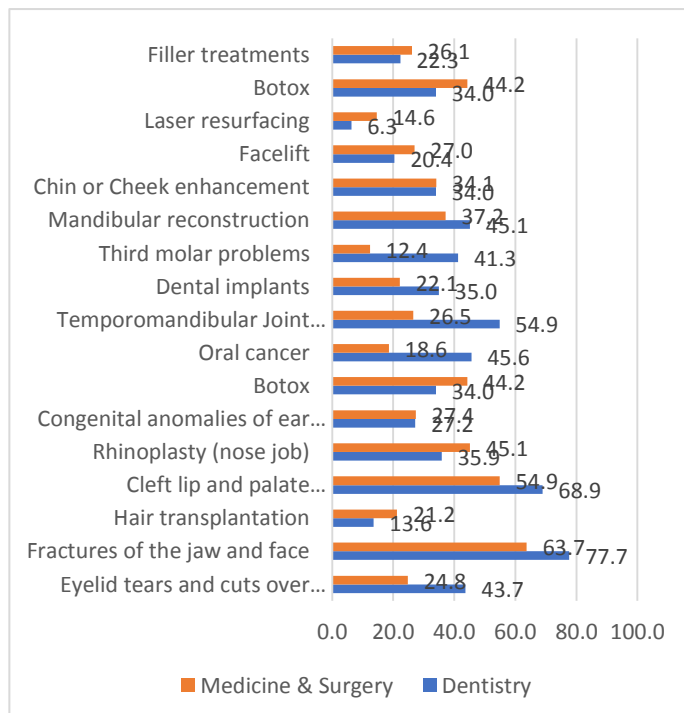
**Figure 3: Distribution of awareness of the original subject to which oral maxillofacial surgery belongs among dental and medical and surgery students**



\* None of the respondents thought it was a branch of vascular surgery or urology

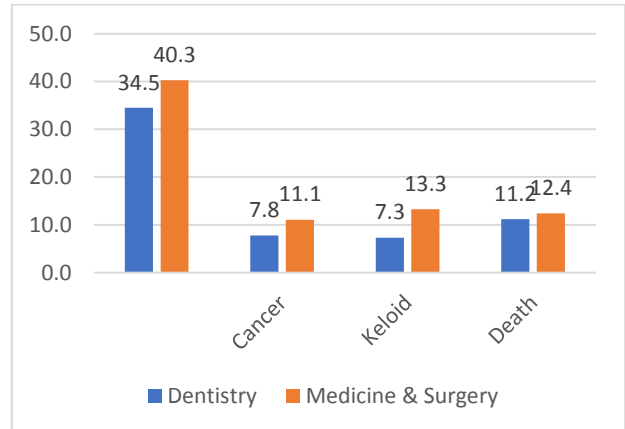
Among specific facial cosmetic and maxillofacial surgeries, most dental (77.7 per cent) and medical (63.7 per cent) students knew ‘surgery for the treatment of fractures of the jaws and face’. Only 6.3 per cent dental students knew ‘laser resurfacing’ surgery, which was the least-known type of surgery. Among medical students, the least-known surgery was ‘third molar disimpaction’, with only 12.4 per cent students having a knowledge of the surgery (Figure 4).

**Figure 4: Awareness of the respondents regarding specific facial cosmetic and maxillofacial surgeries**



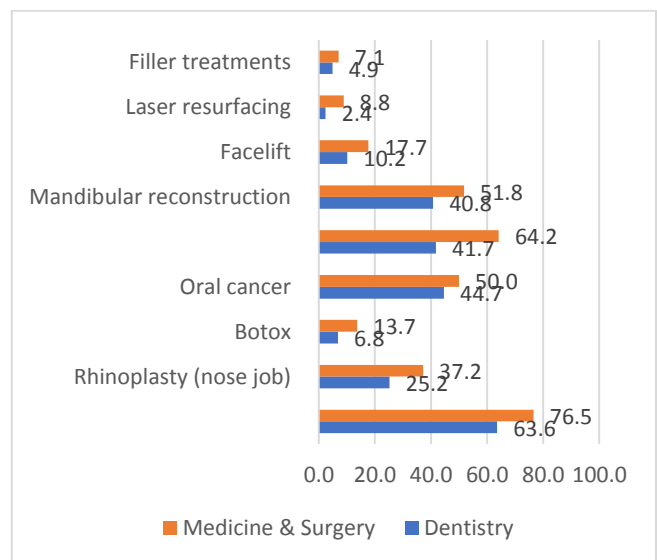
Most respondents (34.5 per cent dental students and 40.3 per cent medical students) were aware of the ‘surgery for correction of deformed body parts’ as a facial cosmetic and oral maxillofacial surgery with the highest risk (Figure 5).

**Figure 5: Awareness of the respondents regarding specific risks of facial cosmetic and maxillofacial surgeries**



Majority of dental (63.3 per cent) and medical (76.5 per cent) students were aware of the necessity for cleft lip and palate surgery (Figure 6).

**Figure 6: Familiarity of the respondents to the necessity of facial cosmetic and maxillofacial surgeries**



The mean awareness score was higher among dental students compared to that among medical students (8.88±4.47 vs. 8.78±4.40), although at a statistically non-significant level (p=0.760). The awareness scores of respondents split by specialty and sociodemographic characteristics are presented in Table 4. Among the studied sociodemographic characteristics, gender, educational institute, and academic GPA were associated with specialty (Table 4).



**Table 4: Association between awareness scores and socio-demographic variables**

Characteristics	Dental Mean ± SD	Medical Mean ± SD	p-value	
Gender			<.001	
Female	8.84±4.48	8.92±4.15		
Male	8.92±4.47	8.72±4.51		
Nationality			.478	
Non-Saudi	9.21±4.07	8.22±4.14		
Saudi	8.83±4.53	8.85±4.43		
Educational institute			<.001	
AlFarabi College	9.20±4.02	7.17±5.23		
Batterjee Medical College	7.17±1.72	6.50±2.68		
Ibn Sina National College for Medical Studies	9.29±4.17	8.67±4.38		
Jeddah University	4.50±2.12	9.17±3.43		
King Abdulaziz University	8.64±4.88	9.97±4.12		
King Saud Bin AbdulAziz University for Health Sciences	13.00±1.41	8.30±4.74		
Umm Al-Qura University	8.24±4.68	7.40±3.13		
Year of undergraduation				.875
2nd year	8.63±3.20	10.10±6.47		
3rd year	8.27±4.22	8.91±4.64		
4th year	8.29±4.20	8.15±3.63		
5th year	8.44±4.83	9.24±4.14		
6th year	9.60±4.61	8.69±4.44		
Academic GPA			<.001	
<2.5	8.43±4.73	9.67±6.47		
2.5 – 2.99	10.19±4.09	10.11±4.65		
3-3.49	8.13±4.54	9.19±4.52		

3.5 - 3.99	8.90±4.49	8.59±4.35
4-4.49	9.05±4.44	9.01±4.54
4.5-5	8.76±4.54	8.48±4.25

SD: Standard deviation; GPA: Grade point average

### Discussion

In our study, total of 412 dental and 452 medicine and surgery students were included. Approximately 36 per cent dental and 35 per cent medical students were previously exposed to rotation duties in various surgical specialties. A much higher percentage of dental students (80.6 per cent) had heard about facial cosmetic and maxillofacial surgery,  $p < 0.001$ . Among specific surgeries, 'surgery for the treatment of fractures of the jaws and face' was known by most dental (77.7 per cent) and medical (63.7 per cent) students. The mean awareness score was higher among dental students compared to that among medicine and surgery students (8.88±4.47 vs. 8.78±4.40). OMFS plays an important role as a specialty in the diagnosis and management of congenital, traumatic, iatrogenic, and developmental deformities occurring in the oral and maxillofacial region.<sup>14</sup> The scope of OMFS has increased considerably in the recent years, as before, OMFS primarily focused on dentoalveolar surgery and routine cases of oral and maxillofacial trauma. However, the specialty has expanded to deal with more advanced procedures.<sup>2,3</sup> Despite the improvements and progress in the field of OMFS, many people are unaware of the branch of OMFS and its scope. Thus, assessments of the familiarity and awareness of medical and dental students, rather than the general population, were more important to decide if attempts to increase the overall knowledge and awareness about OMFS should be targeted undergraduate dental and medical students first or the general population. Studies on the overall awareness of facial cosmetic and oral maxillofacial surgery have been before conducted globally.<sup>11,15</sup> However, no study had analysed the Familiarity and awareness about the specialty among dental and medical students in Saudi Arabia. Thus, awareness of the scope of facial cosmetic and OMFS is vital to deliver effective and most efficient care to the patients. Moreover, there is a tremendous increase in the numbers of cases and overlap with plastic surgery and otorhinolaryngology specialties.<sup>16-18</sup> Therefore, increasing the familiarity and awareness about facial cosmetic and OMFS will help the referral system, and optimal care and management could be delivered properly to patients. Therefore, the aim of this multi-center study was to assess and compare the familiarity and awareness about facial cosmetic and oral maxillofacial surgery among dental and medical undergraduate students.

In our study, we found that much more of dental students (80.6 per cent) had heard about the field of cosmetic and oral maxillofacial surgery in comparison to medical peers (74.8 per cent),  $p < 0.001$ . A possible explanation for this could be that the Saudi health minister and the Saudi commission of health specialties require a bachelor's degree in dentistry to pursue facial and oral maxillofacial surgery at a postgraduate level. In addition, plastic surgery and otorhinolaryngology residents in the kingdom of Saudi Arabia must complete rotation duties in the department of OMFS, essential for their residency requirement, because undergraduate medical students are not exposed to any lectures on facial and maxillofacial procedures or courses during their undergraduate period. Overall, both groups have shown acceptable results, and most participants had heard about the branch of facial and maxillofacial surgery. This shows the expansion of the specialty in comparison to the previous studies.<sup>6,13,15</sup>

Further, we found that dental students were aware of the risks associated with facial cosmetic surgeries in comparison to medical students (47.6 per cent vs. 31.0 per cent),  $p < 0.001$ . However, 75.7 per cent respondents answered that risks of facial cosmetic surgeries are not as serious as other procedures in the surgical discipline. This finding was contrary to that of previous studies.<sup>19,20</sup>

We found that dental students aspired to become facial cosmetic and maxillofacial surgeons (39.3 per cent) more than medical students (12.8 per cent),  $p < 0.001$ . Further, we found that most dental students were aware of the fact that oral maxillofacial surgery is a branch of dentistry, but relatively fewer medical students (42.0 per cent) knew OMFS to be a branch of dentistry. In addition, the average awareness score was higher among dental students compared to medical students. These findings could be explained by the fact that dental students are more exposed to the discipline in comparison to medical students.

A study with similar objectives conducted in Saudi Arabia among medical students found that social media and internet were the most common sources of information,<sup>21</sup> which was also the result of this study. In contrast, another study conducted in Nigeria found that more than half of the participants gained knowledge about facial cosmetic surgery from radio and television.<sup>22</sup> These results show the importance of media in spreading awareness and familiarity among public as well as health-care providers. Since social media and internet were the most-common sources of information in our study, these resources could play an

important role in increasing the familiarity and awareness about the specialty.

Another interesting finding of this study was that higher number of medical students thought that facial cosmetic surgeries are necessary (71.7 per cent), and majority of dental (63.3 per cent) and medical (76.5 per cent) students felt the necessity for cleft lip and palate surgery. These findings support those of a previous study conducted in Nigeria (54.9 per cent) and show the decreased acceptance of other surgical procedures and facial cosmetic surgeries.<sup>22</sup>

According to our questionnaire, the awareness of the respondents about 'surgery for the treatment of fractures of the jaws and face' was greatest in dental (77.7 per cent) and medical (63.7 per cent) students. The least-known surgery by dental students was 'laser resurfacing', with only 6.3 per cent students with an adequate knowledge of the surgery. Among the medical students, the least-known surgery was 'third molar disimpaction', with only 12.4 per cent students with an adequate knowledge of the procedure. These results were also consistent with those of before published studies conducted among health-care providers.<sup>4,14,15,23</sup>

The findings of this study showed that the overall familiarity and awareness of the scope of facial cosmetic and oral maxillofacial surgery among dental and medical students is reasonable. However, it is clear that medical and dental students are not aware of the scope and expertise of the specialty. This could be explained by the lack of exposure to facial cosmetic and oral maxillofacial surgery during undergraduate years and the complicated name of the specialty. Therefore, the facial cosmetic and oral maxillofacial surgery society in Saudi Arabia should aim to increase awareness and familiarity by reaching students through media or electronic or manual brochures elaborating the disciplines and scope of the specialty.

### Limitations

Despite the multi-centric design, a large sample size, and significant study goals, this study has a couple of limitations. Firstly, this was a descriptive cross-sectional study and was conducted in a short time. Therefore, the responders may not represent all medical and dental students in Saudi Arabia. Secondly, we were unable to determine the response rate of the online distribution of the questionnaire, as the overall number of individuals who received the online questionnaire was impossible to determine. Therefore, the generalizability of the responses beyond the survey respondents might be uncertain.

## Conclusion

In conclusion, the familiarity and awareness regarding facial cosmetic and oral maxillofacial surgery among medical and dental students was reasonable. This study ascertains the need for an effective educational program to increase the awareness about this issue as well as the familiarity about facial cosmetic and maxillofacial surgery, which will indirectly enhance success and provision of ideal treatment to the patients.

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The authors declare that they have no competing interests.

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### **ETHICS COMMITTEE APPROVAL**

Approved by the ethics review committee of King Abdulaziz University Hospital, Jeddah, Saudi Arabia (289-19).

**Table 3: Questions and answers related to facial cosmetic and maxillofacial surgery**

Questions	Answers	Dentistry (n=412)		Medicine and surgery (n=452)		p-value
		N	%	N	%	
Have you been previously exposed to a surgical discipline (rotation of surgical specialties)	No	262	63.6	294	65.0	0.656
	Yes	150	36.4	158	35.0	
Have you ever heard of Facial Cosmetic & Maxillofacial surgery?	No	80	19.4	80	17.7	<0.001
	Not sure	0	0.0	34	7.5	
	Yes	332	80.6	338	74.8	
Do you have any relative or friend who has undergone Facial Cosmetic & Maxillofacial surgeries before?	No	286	69.4	258	57.1	<0.001
	Not sure	0	0.0	64	14.2	
	Yes	126	30.6	130	28.8	
Do you know of any risk associated with Facial Cosmetic surgeries?	No	216	52.4	196	43.4	<0.001
	Not sure	0	0.0	116	25.7	
	Yes	196	47.6	140	31.0	
Do you think the risk of Facial Cosmetic procedure is greater than other surgical procedures?	No	150	36.4	192	42.5	0.003
	Not sure	122	29.6	154	34.1	
	Yes	140	34.0	106	23.5	
Do you think Facial Cosmetic Surgeries are necessary at all?	No	134	32.5	78	17.3	<0.001
	Not sure	0	0.0	50	11.1	
	Yes	278	67.5	324	71.7	
Do you think the use of Facial cosmetics can change the general appearance of a person?	Definitely	254	61.7	254	56.2	0.236
	Maybe	140	34.0	172	38.1	
	Not at all	18	4.4	26	5.8	
Have you been previously exposed to medically themed television (for example: House, Grey's Anatomy)?	No	156	37.9	142	31.4	0.046
	Yes	256	62.1	310	68.6	
Do you want to be a Facial Cosmetic & Maxillofacial Surgeon?	No	118	28.6	242	53.5	<0.001
	Undecided	132	32.0	152	33.6	
	Yes	162	39.3	58	12.8	