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Knowledge, awareness, and perception of oral and maxillofacial surgery among the public and professionals in Saudi Arabia: a cross-sectional study

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Abstract. Although oral and maxillofacial surgery (OMS) is expanding rapidly in Saudi Arabia, accurate knowledge of the specialty appears to be lacking. The aim of this study was to assess the knowledge, awareness, and perception of OMS among the public and professionals in Saudi Arabia. A cross-sectional design was adopted, incorporating five groups: dental interns, dental practitioners, medical interns, medical practitioners, and the public. A sample size of 130 was determined for each group, assuming a significance level of 5% and test power of 90%. Surveys were distributed randomly to participants from March to June 2018. For each of 15 specific clinical problems, respondents were asked to choose the most appropriate of three overlapping specialties for treatment, including OMS. A total of 1051 responses were collected. Participants correctly recognized OMS as appropriate for some problems, such as mandibular reconstruction, but for others recognition was poor. Surprisingly, medical professionals were the only group to strongly consider plastic surgery appropriate for treating orthognathic correction. Dental professionals were the most informed. This study highlights the need for greater awareness and education regarding OMS, promoting its development, contribution, and impact among the public and healthcare professionals in Saudi Arabia.

Key words: oral and maxillofacial surgery; awareness; dental and medical professionals; general public; Saudi Arabia.

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Introduction

Oral and maxillofacial surgery (OMS) is an important specialty involved in the diagnosis and clinical and surgical treatment of traumatic, congenital, develop-

mental, and iatrogenic lesions in the oral and maxillofacial complex¹.

The scope of OMS has increased greatly compared to earlier years, in which it was primarily restricted to dentoalveolar surgery and basic maxillofacial trauma. Cur-

rently, the specialty has expanded to include more advanced surgeries, such as the management of benign and malignant pathologies of the head and neck, bone grafting, craniofacial surgery, temporomandibular joint (TMJ) surgery,

treatment of cleft lip and palate, correction of dentofacial deformities, cosmetic facial surgery, implant surgery, and so on^{2,3}. OMS additionally offers non-surgical treatments, such as those targeting facial pain or oral mucosal disease^{1,2}.

OMS is one of the most rapidly expanding specialties in Saudi Arabia (population approximately 33 million), with OMS services centralized in the main cities. Peripheral hospitals provide OMS services through outpatient clinics and day-care facilities. These departments provide all aspects of OMS and accept referrals from all medical and dental practitioners in the area. The demand for OMS services in Saudi Arabia is constantly increasing, especially with the very high incidence of road traffic accidents across the country and the high incidence of oral cancers, particularly in the southern regions. However, despite all of the progress made in this field, it is evident that many remain unfamiliar with the specialty and what OMS practitioners do.

Studies conducted almost two decades ago in the UK and USA reported limited overall awareness of OMS, both among the public and within the medical profession^{4,5}. Around 10 years later, Ifeicho et al. suggested some marginal improvement in the perception of OMS⁶, and Laskin et al. reported good recognition of the specialty name amongst the public⁷. In 2008, Brazilian professionals showed overall good knowledge of the scope of OMS, but the need for further education was suggested¹; in contrast, their French peers and the French public showed better recognition of the specialty⁸. Results of studies in India showed low awareness of OMS amongst both professionals and the general public^{2,3,9}. In developing countries such as Nigeria, where the majority of patients present at a very late stage, a huge lack of awareness has been found amongst both professionals and the public¹⁰. Finally, a recent study targeting medical professionals in Jazan, Saudi Arabia, reported a low level of OMS awareness¹¹.

Recognition of OMS, as well as the scope of its practice, is vital if the specialty is to be practiced to its full potential. To ensure that OMS departments receive appropriate referrals and deliver effective and efficient services, a sound understanding of the specialty is necessary. Moreover, because OMS is separate from dental practice, the knowledge of dental practitioners should be continuously reinforced and updated.

Evaluating awareness of OMS among healthcare professionals and the general

public is of great importance. This is due to the increasing number of cases and the tremendous overlap of OMS with the ear, nose, and throat (ENT) and plastic surgery specialties. Thus, increasing knowledge and awareness of OMS will assist in improving the referral system and therefore the delivery of optimal health care services within the medical industry.

It appears that no study has yet evaluated the knowledge and perception of OMS among the general public and healthcare professionals (dental and medical) in Saudi Arabia. A survey study conducted by Ali et al. in the city of Jazan in the southwest of Saudi Arabia, targeted medical practitioners only¹¹. Thus, the objective of the present study was to assess the level of knowledge, perception, and awareness of OMS among healthcare professionals and adults of the general public in Saudi Arabia.

Materials and methods

Participants

A cross-sectional design was adopted for this study, with the following target groups: (1) dental interns, (2) medical interns, (3) general dental practitioners, (4) general medical practitioners, and (5) adult members of the general public in Saudi Arabia. Participants in the professional groups were excluded if they were students or specialists, or under the age of 24 years. Participants in the public group were excluded if they were members of any of the professional groups or under the age of 18 years. In keeping with Lwanga and Lemeshow¹², the minimum required sample size was determined to be 130 for each group, assuming a significance level of 5% and a test power of 90%, by testing the hypothesis that any two population proportions are equal against the alternative hypothesis that they are not equal, assuming an anticipated absolute difference of 0.20 in the values of the population proportions. The participants were sampled based on specific demographic characteristics. The public participants recruited were at least 18 years old and the professional participants were at least 24 years old. The participants were selected randomly from all regions of Saudi Arabia based on the determined minimum sample size per group. From March to June 2018, 250 hard copy surveys were delivered to the professionals in hospitals and colleges and to the general public in public places, and links to the online survey were sent via WhatsApp, e-mail, and

Twitter to reach out to all five groups in all regions of Saudi Arabia.

Ethical approval for this study was obtained from the Institutional Review Board (IRB) and College of Dentistry Research Centre (CDRC).

Questionnaires

Both the online and hard copy cross-sectional surveys were developed in two versions to address the healthcare professional groups (English) and the general public group (Arabic). All questions concerned the specialties of OMS, ENT, and plastic surgery, without specifying any specialty in the title. The questionnaire consisted of three main sections: (1) demographic data, (2) specialty recognition, and (3) specialty scope of practice.

The first part of the questionnaire included selected characteristics of the participants: sex, age, profession (or educational level in the public version), and region. The second part was related to specialty recognition. In both versions, the questionnaire included multiple choice questions on awareness and recognition of each specialty (OMS, ENT, and plastic surgery), in the form of "Have you ever heard about this specialty?" and "What do you think this specialty branches from?" The third part of the questionnaire contained correlation-based questions in the form of check boxes; the participants were given 15 clinical cases and asked to check the specialty (OMS, ENT, plastic surgery, other) that would best manage them.

All participants were given a brief description of the research project and instructions for accessing the online survey; they were also notified that their participation was voluntary. Informed consent was implied by completion of the survey, and all responses were confidential and anonymous.

Statistical analysis

Data were analysed using JMP 14 Statistical Discovery software (SAS Institute Inc., Cary, NC, USA). Descriptive statistics of the sample demographics and characteristics, aside from speciality and scope of practice recognition, were calculated as frequencies, percentages, mean scores, and standard deviations. An inferential statistical test (adjusted Wald test) was used to determine the differences between some of the research variables with respect to the preferred specialty for the treatment of the clinical cases among the different professional groups.

Results

A total of 168 (16.0%) questionnaires were returned by medical interns, 154 (14.7%) by dental interns, 140 (13.3%) by general medical practitioners, 143 (13.6%) by general dental practitioners, and 446 (42.4%) by the general public, for a total of 1051 responses. Of the 1051 responses received, 206 were hardcopy surveys. The response rate for the hardcopy survey was calculated to be 82.4%. Demographic data of the respondents were analyzed. The respondents in all groups were predominantly female, with a proportion ranging from 61.7% to 70.6%, except the medical practitioners, who showed an equal sex distribution.

Specialty recognition

The majority (>94%) of all groups had heard of plastic surgery and ENT. Most respondents (75.3–100%) had heard of OMS. The general public had the lowest awareness of OMS (with statistical significance), as 110 of the 446 respondents (24.7%) had never heard of the specialty; this group was followed by general medical practitioners (13 of 140 respondents, 9.3%) and medical interns (nine of 168 respondents, 5.4%) (Table 1).

In terms of specialty recognition, 92.9% of dental interns, 94.4% of dental practitioners, 69.6% of medical interns, and 65.7% of medical practitioners recognized OMS as a dentistry specialty, whereas only 24.9% of the general public acknowledged it as belonging to the dental field. The public most often identified it as a subspecialty of plastic surgery (38.3%).

The general public (65.7%), medical interns and practitioners (78.0–84.3%), and dental interns and practitioners (50–55.2%) all considered plastic surgery a subspecialty of general surgery.

Medical interns (66.1%) and practitioners (63.6%) recognized ENT surgery as a subspecialty of head and neck surgery. However, the rest of the groups considered it a specialty of medicine (Table 1).

Scope of practice

For ease of presentation, the 15 clinical situations were grouped into four categories: trauma, pathology, reconstructive surgery, and cosmetic surgery. The results for the five groups of respondents are shown in Tables 2–6.

In the category of trauma, for facial wounds, most participants would consult a plastic surgeon, followed by an OMS surgeon. In contrast, for facial bone frac-

Table 1. Participants' answers to recognition questions of the specialty and its branch.

	OMS		Plastic surgery		ENT	
	n	%	n	%	n	%
Dental interns (n = 154)						
Recognition of the specialty	154	100	153	99.4	154	100
Branch of dentistry	143	92.9	3	2	0	0
Branch of medicine	5	3.2	63	40.9	126	81.8
Subspecialty of general surgery	0	0	77	50	0	0
Subspecialty of head and neck surgery	0	0	0	0	27	17.5
Subspecialty of orthopaedic surgery	2	1.3	11	7.1	1	0.7
Subspecialty of plastic surgery	4	2.6	0	0	0	0
Medical interns (n = 168)						
Recognition of the specialty	159	94.6	167	99.4	167	99.4
Branch of dentistry	117	69.6	1	0.6	1	0.6
Branch of medicine	3	1.8	36	21.4	56	33.3
Subspecialty of general surgery	0	0	131	78	0	0
Subspecialty of head and neck surgery	0	0	0	0	111	66.1
Subspecialty of orthopaedic surgery	10	6	0	0	0	0
Subspecialty of plastic surgery	38	22.6	0	0	0	0
General dental practitioners (n = 143)						
Recognition of the specialty	142	99.3	140	97.9	141	98.6
Branch of dentistry	135	94.4	3	2.1	1	0.7
Branch of medicine	7	4.9	57	39.9	121	84.6
Subspecialty of general surgery	0	0	79	55.2	0	0
Subspecialty of head and neck surgery	0	0	0	0	21	14.7
Subspecialty of orthopaedic surgery	1	0.7	4	2.8	0	0
Subspecialty of plastic surgery	0	0	0	0	0	0
General medical practitioners (n = 140)						
Recognition of the specialty	127	90.7	135	96.4	136	97.1
Branch of dentistry	92	65.7	0	0	0	0
Branch of medicine	4	2.9	22	15.7	49	35
Subspecialty of general surgery	0	0	118	84.3	0	0
Subspecialty of head and neck surgery	0	0	0	0	89	63.6
Subspecialty of orthopaedic surgery	15	10.7	0	0	2	1.4
Subspecialty of plastic surgery	29	20.7	0	0	0	0
Public (n = 446)						
Recognition of the specialty	336	75.3	422	94.6	432	96.9
Branch of dentistry	111	24.9	12	2.7	7	1.6
Branch of medicine	36	8.1	110	24.7	255	57.2
Subspecialty of general surgery	0	0	293	65.7	0	0
Subspecialty of head and neck surgery	0	0	0	0	171	38.3
Subspecialty of orthopaedic surgery	128	28.7	31	7	13	2.9
Subspecialty of plastic surgery	171	38.3	0	0	0	0

tures, most would consult an OMS surgeon, followed by a plastic surgeon.

In the category of pathology, there was a significant difference in the responses of the medical and dental groups regarding the treatment of facial abscesses ($P < 0.0001$). Dental interns and practitioners would consult an OMS surgeon for facial abscesses, whereas medical interns and practitioners would consult a plastic surgeon. The majority of participants would most likely consult an OMS surgeon for the treatment and management of jaw cysts and tumours, as well as for TMJ disorders. For cases of oral cancer, dental interns and practitioners (73.8–77.8%), medical practitioners (49.2%), and the general public (44.9%) indicated OMS for management, whereas medical interns (47%) indicated ENT. For the

treatment of salivary gland disorders, a significant difference in specialty preference was found between the medical and dental groups ($P < 0.0001$), with most dental interns (72.3%) and practitioners (67.7%) considering OMS the appropriate specialty, and the rest of the groups mainly selecting ENT. For lumps in the neck, ENT was predominantly selected by medical interns (60.9%), medical practitioners (59.4%), and the public (41.5%); dental interns (51%) and practitioners (47.4%) were the only groups who predominantly selected OMS.

In the category of reconstructive surgery, a significant difference was observed between the opinions of the medical and dental groups regarding the treatment of cleft lip and palate ($P < 0.0001$). Only 15.2% of medical interns and 22.8% of

Table 2. Responses of dental interns (n = 154).

	OMS	Plastic surgery	ENT	Other
Trauma				
Facial wounds	37.3%	58.5%	2.8%	1.4%
Facial bone fractures	72.1%	20.7%	7.2%	0%
Pathology				
Facial abscesses	77.1%	10.4%	6%	6.6%
Jaw cysts	91.5%	3%	3%	2.4%
Jaw tumours	81.3%	10.7%	5.9%	2.1%
Oral cancer	73.8%	9.9%	10.4%	5.9%
Salivary gland disorders	72.3%	1.1%	19.8%	6.8%
TMJ disorders	87%	2.4%	4.7%	5.9%
Lump in the neck	51%	10.3%	32%	6.7%
Reconstructive surgery				
Cleft lip and palate	56.2%	26%	15.9%	1.9%
Mandibular reconstruction	75.7%	22.8%	1%	0.5%
Sinus surgery	65.2%	1%	32.8%	1%
Cosmetic surgery				
Rhinoplasty	27.4%	38.2%	33.6%	0.8%
Face lifting and blepharoplasty	35.7%	59.2%	3.3%	1.9%
Jaw deformity affecting appearance	57.2%	40.1%	1.8%	0.9%

ENT, ear, nose and throat; OMS, oral and maxillofacial surgery; TMJ, temporomandibular joint.

Table 3. Responses of medical interns (n = 168).

	OMS	Plastic surgery	ENT	Other
Trauma				
Facial wounds	11.2%	79.7%	6.1%	3.1%
Facial bone fractures	61.4%	20.3%	14.1%	4.2%
Pathology				
Facial abscesses	24.3%	40%	26.4%	9.4%
Jaw cysts	52.1%	8.7%	36.5%	2.7%
Jaw tumours	47.7%	10.1%	37.1%	5.1%
Oral cancer	39.1%	7%	47%	7%
Salivary gland disorders	19.7%	0.5%	75.7%	4.2%
TMJ disorders	59%	4.9%	28.3%	7.8%
Lump in the neck	9%	17%	60.9%	13.2%
Reconstructive surgery				
Cleft lip and palate	15.2%	60.6%	19.9%	4.3%
Mandibular reconstruction	54.9%	33.5%	11.2%	0.4%
Sinus surgery	16%	5.9%	74.9%	3.2%
Cosmetic surgery				
Rhinoplasty	5.1%	40.2%	54.3%	0.4%
Face lifting and blepharoplasty	17.8%	68.1%	9.9%	4.2%
Jaw deformity affecting appearance	45.3%	45.7%	8.6%	0.4%

ENT, ear, nose and throat; OMS, oral and maxillofacial surgery; TMJ, temporomandibular joint.

medical practitioners considered an OMS surgeon responsible for the treatment of cleft lip and palate, instead clearly preferring a plastic surgeon. In contrast, most dental interns (56.2%) and dental practitioners (55%) considered an OMS surgeon most appropriate for the treatment of cleft lip and palate deformities. Regarding sinus surgery, medical groups and the general public considered ENT the most relevant specialty, whereas the dental groups preferred OMS. For mandibular reconstruction, all participants would most likely consult an OMS surgeon, followed by a plastic surgeon.

In the category of cosmetic surgery, for cases of rhinoplasty, most dental interns, dental practitioners, and the general public

preferred plastic surgery; most medical interns and practitioners chose the ENT specialty to address these cases. Most participants agreed that a plastic surgeon would best handle face lifting and blepharoplasty cases. For dentofacial deformities affecting appearance, the dental group (57.2–58.3%) and the general public (63%) would consult an OMS surgeon, whereas the medical group (45.7–47%) would consult a plastic surgeon.

Discussion

In 1977, the field of oral surgery in the USA was renamed 'oral and maxillofacial surgery' to clarify to the public the specialty's scope of practice. However, there

has been some concern regarding whether this objective was accomplished. To answer this question, it is important to evaluate the knowledge, awareness, and perception of both healthcare professionals and the adult general public¹³.

As one of nine internationally accepted surgical disciplines, OMS is recognized by the Saudi Health Minister and the Saudi Commission for Health Specialties as a dental specialty, which requires only a Doctor of Dental Surgery (DDS) degree to start pursuing postgraduate studies. In some other countries of the world, such as the USA, it is an accepted specialty of dentistry; in others, such as the UK, it is considered a double major specialty that requires a degree in both medicine and dentistry². In Saudi Arabia, OMS surgeons work independently in their own department. However, they can work alongside ENT, plastic surgery, neurosurgery, and orthopaedic clinicians to treat different conditions such as panfacial trauma, craniofacial deformities, and malignancy. Also, OMS, ENT, and plastic surgery residents in Saudi Arabia must complete rotations in each department to fulfil their requirements, whereas undergraduate medical students do not have any OMS courses in their curricula.

This study aimed to evaluate the awareness and knowledge of the scope of OMS among medical professionals, dental professionals, and the adult general public in Saudi Arabia. The five groups investigated in this study included professionals who treat patients and refer them to OMS (medical interns, general medical practitioners, dental interns, and general dental practitioners), as well as the adult general public, who, armed with the correct information, may request an OMS referral.

The title of the questionnaire did not refer to OMS; instead, it referred to 'different medical specialties' to avoid leading answers and possible biased data. Despite the use of a short and simple questionnaire, the number of respondents in each of the five groups differed, particularly the adult public group, which surpassed the other four professional groups. A possible explanation for this is the high proportion of the public group in comparison to the professional groups. An additional factor could be a lack of enthusiasm amongst professionals to fill in a survey. The use of different data collection methods, such as restricting the number of surveys provided to each group, might have helped in obtaining specific numbers. Women filled in more surveys than men (65.5% vs. 34.5%). The higher proportion of female respondents could be due to the

Table 4. Responses of general dental practitioners (*n* = 143).

	OMS	Plastic surgery	ENT	Other
Trauma				
Facial wounds	28.8%	68.36%	1.13%	1.7%
Facial bone fractures	77.7%	17.71%	4.57%	0%
Pathology				
Facial abscesses	76.9%	16%	5.3%	1.8%
Jaw cysts	87.4%	5%	4.4%	3.1%
Jaw tumours	82.6%	9.9%	5.2%	2.3%
Oral cancer	77.8%	8.5%	10.8%	2.8%
Salivary gland disorders	67.7%	1.8%	22.2%	8.4%
TMJ disorders	87.3%	3.2%	3.8%	5.7%
Lump in the neck	47.4%	10.9%	38%	3.7%
Reconstructive surgery				
Cleft lip and palate	55%	29%	13.9%	2.1%
Mandibular reconstruction	75%	20.5%	2.8%	1.7%
Sinus surgery	56.8%	4.7%	37.4%	1.1%
Cosmetic surgery				
Rhinoplasty	21.3%	40.1%	36.6%	2%
Face lifting and blepharoplasty	35.1%	58.4%	3.8%	2.7%
Jaw deformity affecting appearance	58.3%	39.2%	1.51%	1%

ENT, ear, nose and throat; OMS, oral and maxillofacial surgery; TMJ, temporomandibular joint.

Table 5. Responses of general medical practitioners (*n* = 140).

	OMS	Plastic surgery	ENT	Other
Trauma				
Facial wounds	19.6%	74.9%	4.9%	0.6%
Facial bone fractures	68.2%	18.4%	10.6%	2.8%
Pathology				
Facial abscesses	32.8%	41.5%	18%	7.7%
Jaw cysts	55.3%	7.7%	31.8%	5.3%
Jaw tumours	52.4%	9.1%	30%	8.6%
Oral cancer	49.2%	6.3%	35.1%	9.4%
Salivary gland disorders	24.2%	3.1%	64.6%	8.1%
TMJ disorders	58.9%	6%	24.4%	10.7%
Lump in the neck	8.2%	16.5%	59.4%	15.9%
Reconstructive surgery				
Cleft lip and palate	22.8%	50%	23.9%	3.3%
Mandibular reconstruction	56.8%	29%	10.9%	3.3%
Sinus surgery	11.3%	9.3%	73.5%	6%
Cosmetic surgery				
Rhinoplasty	4.5%	39.9%	53.4%	2.3%
Face lifting and blepharoplasty	17%	70.2%	8.8%	4.1%
Jaw deformity affecting appearance	42.7%	47%	7.6%	2.7%

ENT, ear, nose and throat; OMS, oral and maxillofacial surgery; TMJ, temporomandibular joint.

dynamic changes in the Saudi community towards greater female participation in society and an eagerness of the women to fulfil this expectation. The high response rate (82.4%) might be explained in part by the use of a relatively short questionnaire. Additionally, the questionnaire was found to be appealing and interesting to most participants, as after completing the survey, they were curious to know the correct answers.

All groups presented promising results, with the majority having heard of the OMS specialty. This indicates that the specialty has grown to the extent that its name has become recognized by many people around the country. However, al-

though the dental and medical groups were aware that OMS is a subspecialty of dentistry, the public were unaware, believing it instead to be a subspecialty of plastic surgery. Additionally, small proportions of medical interns and practitioners (20–22%) shared the public's incorrect belief. As the specialty name suggests, oral and facial surgery involves operations on and around the face; because this area requires cosmetic services, some may believe it branches from plastic surgery. In a survey targeting only medical practitioners in Jazan, 84% agreed that OMS was a subspecialty of dentistry¹¹, which exceeds the number found in the present study (65.7%) and indicates better perception of the spe-

cialty branch among the practitioners in Jazan. It could be argued that the scope of different dental and medical specialties still results in misconceptions, especially among the general public. However, the majority of healthcare professionals recognize OMS.

Given the long and complicated Latin name of OMS and the importance of the specialty in managing complex problems within a well-defined anatomical area, Ameerally et al.⁴ proposed changing the name to something much simpler, such as 'oral and facial surgery', and recommended that a better system of education should be used for both the public and professionals, including medical and dental students. According to Parnes¹⁴, the governing bodies of the American Association of Oral and Maxillofacial Surgery discussed a possible name change for the specialty in 1993. This was ultimately rejected due to concerns that the abandoned name 'OMS' might be adopted by either dentistry or medicine¹⁴.

Hunter et al.⁵ demonstrated that most professionals, including dental and medical students, had heard of OMS, but only a few accurately recognized the scope of the specialty. This was attributed to the lack of promotion in the media, along with the fact that OMS is grounded in dentistry rather than medicine. In 2002, Laskin et al.⁷ evaluated knowledge of the types of treatments offered by 12 different specialties to determine whether this lack of familiarity was present only for OMS or whether it occurred with other specialties. The results showed that name recognition was not a problem unique to OMS, indicating that names alone cannot be perfectly descriptive. A study performed in 1996 assessed the referral decisions among general medical practitioners¹⁵. The majority were unaware of the range of conditions managed by OMS surgeons. A series of strategies were outlined to broaden the referral base for maxillofacial surgery. The authors recommended emphasizing active education of practitioners and discussing the possible effects of service regionalization¹⁵.

The results of the current study showed a generally good awareness of the scope of OMS among dental and medical practitioners and the general public. However, dentists and dental interns had a greater appreciation for and knowledge of the scope of OMS, as indicated by their responses. Medical practitioners and the general public demonstrated a lack of awareness of the ability of OMS to treat certain medical conditions, but surprisingly, the general public seemed more aware

Table 6. Responses of the general public (n = 446).

	OMS	Plastic surgery	ENT	Other
Trauma				
Facial wounds	35.9%	54.1%	3.5%	6.5%
Facial bone fractures	67%	25.2%	4.6%	3.3%
Pathology				
Facial abscesses	37.6%	21.5%	16.2%	24.7%
Jaw cysts	57.1%	21.1%	8.9%	12.9%
Jaw tumours	66.4%	11.7%	6.5%	15.4%
Oral cancer	44.9%	5.2%	19%	30.9%
Salivary gland disorders	10.3%	0.8%	56.3%	32.6%
TMJ disorders	71.2%	7.4%	5.7%	15.8%
Lump in the neck	12%	10.4%	41.5%	36.1%
Reconstructive surgery				
Cleft lip and palate	24.8%	60.3%	9.3%	5.7%
Mandibular reconstruction	64.2%	31.6%	0.6%	3.6%
Sinus surgery	26.4%	5.2%	63.6%	4.8%
Cosmetic surgery				
Rhinoplasty	4.7%	73.6%	19.7%	2%
Face lifting and blepharoplasty	8%	86.9%	0.9%	4.2%
Jaw deformity affecting appearance	63%	28.9%	1.2%	6.9%

ENT, ear, nose and throat; OMS, oral and maxillofacial surgery; TMJ, temporomandibular joint.

of the scope of OMS than the medical interns and practitioners. This suggests that the medical groups can sometimes underestimate the scope of dental practice, limiting this to the teeth or jaws.

In general, the survey in this study showed that cases of facial bone fracture would most likely be treated by an OMS surgeon, whereas facial wounds would likely be treated by a plastic surgeon; these results are consistent with those of previously published studies^{1,3-5,8,9}. This is justified by the belief that any situation involving the face and primarily affecting cosmetic appearance can be managed only by a plastic surgeon. The fact that both OMS and plastic surgeons can address facial wounds should be further promoted.

With regard to pathological conditions, medical interns and practitioners believed plastic surgeons to be more qualified in the treatment of facial abscesses, whereas the general public and dental interns and practitioners preferred OMS surgeons. There was a significant difference in the responses of the medical and dental groups ($P < 0.0001$). These results suggest that medical practitioners and interns may lack knowledge of or overlook the predominantly odontogenic origins of facial abscesses. This may affect the medical services provided if patients present first to medical primary care.

For the treatment of oral cancer, the general public, medical practitioners, and dental interns and practitioners agreed that they would consult an OMS surgeon; only medical interns preferred an ENT surgeon. This is in contrast to Rocha et al.¹, who found that both medical and dental practitioners preferred head and

neck surgery for oral cancer treatment. This could be explained by the fact that medical interns lack clinical exposure to OMS, given the overlap of the OMS and ENT fields. In cases of salivary gland disorders, all except the dental groups preferred ENT surgeons for treatment, whereas the dental groups chose OMS surgeons, as expected. There was a significant difference in the responses between the medical and dental groups ($P < 0.0001$). Similar results were observed for the treatment of lumps in the neck, which is in agreement with Ameerally et al.⁴. The medical groups and general public need greater awareness of the pathology services provided by OMS.

A higher percentage of participants considered an OMS surgeon to be most qualified to treat cysts and tumours of the jaws. These results are in contrast to those of Rocha et al.¹. All participants were aware that mandibular reconstruction and TMJ disorders fall within the scope of OMS, differing from the findings of Hunter et al.⁵, but agreeing with those of Rocha et al.¹.

Contradicting Herlin et al.⁸ and supporting other studies^{1,3,4,11}, only small percentages (15–24%) of the medical groups and the general public were aware that OMS surgeons treat cleft lip and palate deformities; these groups strongly agreed on plastic surgeons being most appropriate instead. A significant difference was observed between the responses of the medical and dental groups ($P <$

0.0001). With regard to the medical groups, this could be explained by the fact that they

see many cleft lip and palate cases in the medical field with the plastic surgery team. It is clear that general practitioners are unaware that the treatment of cleft lip and palate is becoming more multidisciplinary, with a team approach involving OMS surgeons.

Sinus surgery is usually within the scope of ENT^{16,17}, as most groups were aware. However, the dental groups selected OMS. As dental professionals are well aware that the scope of OMS involves maxillary sinus surgeries, such as placing implants, retrieving escaped teeth, and correcting oroantral communication^{18,19}, they may have immediately thought of OMS even when it did not apply. Whether they are aware that OMS surgeons are responsible for the treatment of maxillary sinus lesions of odontogenic origin could not be concluded.

For jaw deformities affecting appearance, the dental group and general public would consult an OMS surgeon, whereas the medical group would consult a plastic surgeon. This could be due to a lack of knowledge that OMS is mainly responsible for the treatment of skeletal facial deformities, and may lead to ineffective referral paths for patients with jaw deformities.

The particular problems with respect to the knowledge of medical practitioners and interns, many of whom are local graduates, may reflect the lack of OMS education in the local medical school undergraduate curricula, as OMS is considered a bridging specialty between medicine and dentistry. This may also explain why dental practitioners and interns are better informed about OMS than medical groups, as they receive thorough education on the specialty during their undergraduate courses.

Despite the high response rates in this study, some limitations and potential bias are acknowledged. These include the inability to report the response rate for the online survey. This was difficult to quantify since identifying the total number of people who received the online survey would be almost impossible. Thus the generalizability of the responses beyond the survey respondents might be uncertain. The sex distribution results also represent a limitation. The respondents were predominantly female (65.4%) and this is not representative of the target Saudi population, which is predominantly male (57.4% vs. 42.2%)²⁰.

In conclusion, awareness of the main scope of OMS practices is low among medical practitioners, medical interns, and the general public in Saudi Arabia. Dental interns and practitioners demonstrated the best knowledge of all groups; however, this does not negate the need for continuous education and awareness-raising on OMS in the dental community. Opportunities must be taken to promote the specialty in the workplace and the media; a better system of education must be structured for both the professional and public communities. Knowledge and awareness of OMS will directly improve its success and timeliness in delivering optimal healthcare services. Additionally, OMS should be promoted among the general public so that they can request appropriate referrals.

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Competing interests

The authors declare that there are no conflicts of interest

Ethical approval

Ethical approval for this study was obtained from the Institutional Review Board (IRB) and College of Dentistry Research Centre (CDRC) under registration numbers E-18-3263 and IR-0274, respectively.

Patient consent

Not required.

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