J. Maxillofac. Oral Surg. (Oct–Dec 2019) 18(4):623–627
https://doi.org/10.1007/s12663-018-1180-6

ORIGINAL ARTICLE

A Multi-site Cross-Sectional Survey Exploring Medical Undergraduate Knowledge of Oral and Maxillofacial Surgery

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Received: 8 November 2018 / Accepted: 6 December 2018 / Published online: 3 January 2019

Abstract
Purpose To evaluate medical student exposure to OMFS and knowledge of which clinical cases are appropriate to refer to the OMFS surgeon and the academic requirements to pursue a career in OMFS.
Methods The investigators designed and distributed a cross-sectional survey to a cohort of current UK medical students. The primary outcome was medical student knowledge of the role of the OMFS, which was measured by their ability to correctly identify which cases were appropriate to refer to OMFS. Secondary outcomes included: identifying the proportion of students exposed to OMFS and the nature of this exposure; identifying student knowledge of the requirements to commence OMFS speciality training; and comparing knowledge of OMFS in those exposed to OMFS at medical school and those not exposed. The investigators hypothesised that undergraduates exposed to OMFS would have a greater understanding of the role of the OMFS and the requirements to pursue this speciality.
Results Of the 299 participants included in this study, 77.4% (230) had no exposure to OMFS at medical school. Overall, the students exposed to OMFS at medical school performed superiorly (mdn = 13) to the OMFS-naïve students (mdn = 13), z-score = 2.185, $p = 0.03$, in correctly identifying cases to refer to an OMFS surgeon. They also were more likely to correctly identify the requirement of core surgical training (CST) ($p = 0.04$, $\chi^2 = 4.182$) and membership of the Royal College of Surgeons ($p = 0.02$, $\chi^2 = 9.879$) as needed to begin OMFS speciality training.
Conclusion Exposure to OMFS is still limited within the medical undergraduate curriculum, and this is reflected in poor knowledge of OMFS. An increase in the amount of contact with OMFS at an undergraduate level would not only help create greater interest in OMFS as a career but would help doctors of all specialities when exposed to OMFS.

Keywords Oral and maxillofacial surgery · Education · Undergraduate study · Medical school

Introduction

Oral and maxillofacial surgery (OMFS) is a surgical speciality whose remit predominantly involves diagnosing and managing conditions relating to the neck, face and mouth [1]. Although a relatively young speciality, it has seen its scope grow considerably with time [2]. OMFS is now well established in both medicine and dentistry but paradoxically can be neglected by both professions [3]. This is evident through the lack of knowledge amongst the public and health professionals alike and misconceptions about the role of the OMFS surgeon [4–8].

A systematic search of the current literature revealed a paucity of recent data on OMFS education and subsequent knowledge within the medical school curriculum [9]. Only three UK studies of medical students have been undertaken, which all showed the vast majority of medical students (range 72–82%) had no exposure to OMFS [3, 10, 11].

This issue has become particularly pertinent given an increasing reliance on medicine-first trainees [10] who

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have been shown to have less exposure to OMFS than their dental counterparts [3, 12]. OMFS has also seen shortages in speciality registrars, and the 2017 recruitment data have shown a decrease in the number of applicants per position with only a 66.67% fill rate at an ST3 level [13] and OMFS 10% of speciality registrar posts unfilled [14]. It is widely known that speciality choice is influenced by exposure to that speciality [15, 16] and these shortcomings highlight the importance of the presence of OMFS in the medical undergraduate curriculum.

With the most recent data in this field being 6 years old, there is no research which has evaluated this generation of medical undergraduates. Now more than previously, the speciality needs to be mindful of the exposure current medical undergraduates have, as, if current trends continue, they are likely to fill the majority of OMFS registrar positions.

The aims of this study, therefore, were to: (1) evaluate medical undergraduate knowledge of the role of OMFS; (2) identify proportion of medical undergraduates exposed to OMFS and the nature of the exposure; (3) determine whether exposure to OMFS related to knowledge; and (4) to determine medical student knowledge of the requirements to pursue OMFS.

Methods

A short survey ("Appendix 1") was designed using expert knowledge alongside the Intercollegiate Surgical Curriculum Programme descriptions [1] and utilising previous literature [10]. Participants were recruited between April and June 2018 via email and social media, whereby they were invited to complete an online version of the survey (at www.surveymonkey.com). Physical copies of the survey were also distributed following after lectures. Medical students from every UK medical school were approached.

Information about the questionnaire was provided ahead of the survey itself, and potential participants were informed that consent would be presumed by completion of the survey.

Following the collection period, data from the survey were collated and analysed. Simple descriptive analysis was undertaken originally revealing a non-normative distribution of scores, leading to utilisation of the Mann–Whitney test. The categorical data were analysed using Chi-squared tests. For all results, a p value of < 0.05 was considered to be statistically significant.

Results

Participant Demographics

A total of 302 individuals from 16 UK universities completed the questionnaire. Of these participants, three were excluded (two dentally qualified and one not a medical undergraduate). Of the 299 participants included, 42.5% (127) were male, 57.1% (171) were female, and 0.3% (1) identified as another gender. With respect to year of study, there were 22.1% (66) in Year 1; 24.7% (74) in Year 2; 13.4% (40) in Year 3; 14.7% (42) in Year 4; 18.4% (55) in Year 5; 6.0% (18) in Year 6; and 1.3% (4) were intercalating.

Exposure to OMFS

With respect to undergraduate exposure, the majority (77.2%, $n = 230$) of participants stated they had none; though 14.1% (42) had incidental exposure whilst on other placements; 7.7% (23) had teaching in the form of lectures or seminars; 5.7% (17) had clinical placement; and 2.35% (7) completed Student Selected Components (SSCs).

Knowledge of the Role of the Oral and Maxillofacial Surgeon

Overall, OMFS-exposed undergraduates performed superiorly, with the proportion of correct responses higher (mdn = 13), than those who were OMFS-naïve (mdn = 13), z-score = 2.185, $p = 0.03$.

Table 1 outlines results on which clinical cases are appropriate to refer to OMFS. Overall, the vast majority of undergraduates recognised facial bone fractures (93.9%), congenital facial deformities (82.4%) and cleft lip and palate surgery (79.0%) as cases appropriate to refer to OMFS. Furthermore, relatively few students felt it appropriate to refer orthodontic provision (15.3%), toothache (10.2%) and denture provision (11.9%). Only a minority of students (13.9%) correctly identified tracheostomy provision as within the remit of OMFS.

Students with exposure to OMFS were more able to recognise oral mucosal disease, face and neck infections, lacerations to the face and neck and oral cancer as being appropriate to refer to OMFS ($p < 0.05$), but less likely to refer to nasal surgery cases.

Table 1 Undergraduate selection of cases appropriate to refer to OMFS

	OMFS-exposed group % (*n*)	OMFS-naïve group % (*n*)	Total % (*n*)	*p* value (χ^2)
Facial bone fractures	98.5% (67)	92.5% (210)	93.9% (277)	0.07 (3.308)
Oral mucosal disease	52.9% (36)	36.1% (82)	40.0% (118)	**0.01 (6.167)**
Orthodontic provision (braces)	22.1% (15)	13.2% (30)	15.3% (45)	0.08 (3.165)
Congenital facial deformity	89.7% (61)	80.2% (182)	82.4% (243)	0.07 (3.273)
Facial skin cancer	48.5% (33)	38.3% (87)	40.7% (120)	0.13 (2.258)
Toothache	10.3% (7)	10.1% (23)	10.2% (30)	0.97 (0.002)
Face and neck infections	55.9% (38)	30.4% (69)	36.3% (107)	< **0.01 (14.703)**
Ear surgery	11.8% (8)	11.9% (27)	11.9% (35)	0.98 (0.001)
Restoration of teeth (fillings/crowns)	11.8% (8)	15.8% (36)	14.9% (44)	0.41 (0.691)
Aesthetic facial surgery	48.5% (33)	55.9% (127)	54.2% (160)	0.28 (1.160)
Denture provision	10.3% (7)	12.3% (28)	11.9% (35)	0.65 (0.208)
Salivary gland disease	52.9% (36)	40.5% (92)	43.4% (128)	0.07 (3.282)
Lacerations to the face and neck	70.6% (48)	53.7% (122)	58.0% (171)	**0.01 (6.080)**
Peritonsillar abscess (quinsy)	33.8% (23)	25.1% (57)	27.1% (80)	0.16 (2.010)
Tracheostomy provision	7.4% (5)	15.9% (36)	13.9% (41)	0.07 (3.164)
Tonsillitis	5.9% (4)	7.5% (17)	7.1% (21)	0.65 (0.204)
Laryngeal cancer	36.8% (25)	34.8% (79)	35.3% (104)	0.77 (0.088)
Oral cancer	75.0% (51)	58.6% (133)	62.3% (184)	**0.01 (6.004)**
Cleft lip and palate surgery	85.3% (58)	77.1% (175)	79.0% (233)	0.15 (2.120)
Nasal surgery	25.0% (17)	38.3% (87)	**34.8% (104)**	**0.04 (4.071)**

Results in bold indicate statistically significant results

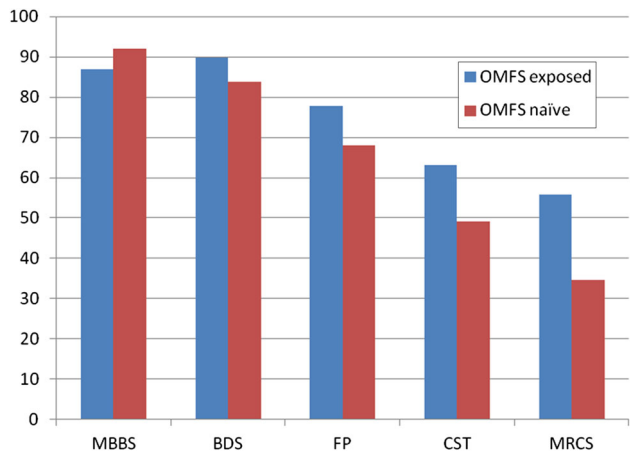

Fig. 1 Undergraduate selection of the requirements to commence OMFS speciality training (ST3) (*MBBS* medical degree, *BDS* dental degree, *FP* completion of foundation programme, *CST* completion of core surgical training, *MRCS* membership of the Royal College of Surgeons)

Requirements for Commencing OMFS Speciality Training

Participant responses are outlined in Fig. 1. There was a significant difference between groups in knowledge that completion of core surgical training (CST) ($p = 0.04$, $\chi^2 = 4.182$) and membership of the Royal College of Surgeons (MRCS) ($p = 0.02$, $\chi^2 = 9.879$) are required to commence OMFS speciality training, with the OMFS-exposed group more likely to appreciate that these were requirements. There was not a significant difference in knowledge that a medical degree (MBBS) ($p = 0.23$, $\chi^2 = 1.470$), dental degree (BDS) ($p = 0.62$, $\chi^2 = 0.251$) or completion of the foundation programme (FP) ($p = 0.13$, $\chi^2 = 2.348$) are required.

Discussion

This is the largest and broadest study to date, involving a substantial number of undergraduates and representing half of the current UK medical school institutions. In line with earlier literature, this study indicated that the great majority of medical students still do not have exposure to OMFS [3, 10, 11]. Additionally, amongst the exposed undergraduates, the majority of their exposure was incidental rather than timetabled.

In comparison with the results of Goodson et al. [10], some key differences can be seen. Whilst there is no significant change in the proportion of students who believe restoration of teeth is under the remit of OMFS surgeons (14.2–14.9%), there are less who believe orthodontic appliances and denture provision fall under the OMFS

remit (26.9–15.3% and 25.7–11.9%, respectively). Additionally, there are more students who recognise facial aesthetic surgery under the remit of OMFS surgeons (43.1–54.2%), alongside with an increase with respect to nasal and ear surgery (19.8–34.8% and 3.6–11.9%, respectively).

Our research adds the growing body of evidence of the importance of OMFS teaching in the medical curriculum, with exposed students having significantly superior knowledge on the cases appropriate to refer to OMFS, and the entry requirements for OMFS specialisation.

This paper included a diverse cohort of medical students from different years and medical schools and had a very low exclusion rate at 1%. Furthermore, with the vast majority of participants completed all sections of the questionnaire, with very little attrition within the study. However, it should be noted that the respondents to this survey may have a more inflated knowledge of the specialism compared to the general undergraduate population.

We would recommend and welcome additional opportunities for medical undergraduates to be exposed to OMFS within their curriculum. This could be in the form of paired placements alongside dental students or greater utilisation of Student Selected Components (SSCs). We appreciate undergraduate curriculums are already very dense; however, it may be appropriate to add OMFS teaching to existing ear, nose and throat (ENT) teaching within a surgical block, or combine the teaching of these specialities in the form of a general head and neck module. Not only would this potentially increase interest in OMFS as a career it would be beneficial to all undergraduates, particularly those wishing to pursue broad specialities such as emergency medicine or general practice.

Acknowledgements The authors would like to thank Laura Sandland-Taylor on her collaboration with this work.

Compliance with Ethical Standards

Ethical Approval Ethical approval was sought and granted on by the Hull York Medical School Ethics Committee (ref 1812) in April 2018.

Appendix 1: Oral and Maxillofacial Surgery Awareness

You are being invited to participate in a research study entitled 'Medical Student Awareness of Oral and Maxillofacial Surgery'. This study is being done by Katherine Harris and Christopher Jefferies from Hull York Medical School.

The purpose of this research study is to ascertain the level of exposure medical students have to oral and maxillofacial surgery and whether this is related to knowledge of this speciality. It will take an estimated 3 min to complete.

Your participation is voluntary and you can withdraw at any time. You are free to omit any question.

We believe there are no known risks with this study; however, as with any online-related activity, the risk of data breach is always possible. To the best of our ability, your answers will always remain anonymous. We will minimise any risks to breach of anonymity. *Consent will be presumed by completion of the survey.*

1. What is your gender?
   Male/Female/Other (please specify)
2. Which medical school do you attend?
3. Which year of medical school are you in?
   1st/2nd/3rd/4th/5th/6th/Intercalating/Other (please specify)
4. Do you have a degree in dentistry?
   Yes/No
5. What teaching or exposure to oral and maxillofacial surgery have you had at medical school?
   None/Teaching (ie lectures or seminars)/Placement/Student selected modules/No timetabled teaching, but exposure whilst on other placements (ie in A&E)
6. Which of the following are entry requirements to commence oral and maxillofacial speciality training (as a speciality registrar/ST3)?
   Medical degree (MBBS)/Dental degree (BDS/BChD)/Completion of foundation training/completion of core surgical training/MRCS (Membership of the Royal College of Surgeons)
7. Which of the following could be appropriate to refer to an oral and maxillofacial surgeon?
   Facial bone fractures/Oral mucosal disease/Orthodontic provision (braces)/Congenital facial deformity/Facial skin cancer/Toothache/Face and neck infections/Ear surgery/Restoration of teeth (fillings/crowns)/Aesthetic facial surgery/Denture provision/Salivary gland disease/Lacerations to the face and neck/Peritonsillar abscess (quinsy)/Tracheostomy provision/Tonsillitis/Laryngeal cancer/Oral cancer/Cleft lip and palate surgery/Nasal surgery
8. Describe oral and maxillofacial surgery in three words?

Thank you for participating in our study. For any questions, or should you wish to receive a copy of the study results, please email hykh6@hyms.ac.uk.

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