

## Is there a fragmentation in the oral and maxillofacial surgery research? A scientometric brief analysis of specialty's journals.

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**Abstract:** Aim: To evaluate, using the Scopus database, the input and output citation pattern in the year 2015 for documents published in the five main oral and maxillofacial (OMS) journals. Methods: All document types published over the 2013–2015 period by the five main OMS journals: *BJOMS*, *JOMS*, *IJOMS*, *JCMFS* and *JCFS* were included. Citation and referencing data were extracted from the advanced search of Scopus. Results: A total of 2303 documents were published by the journals in 2015, and 3253 documents published in 2015 cited documents published by the journals in 2013 and 2014. Self-citation was 13.19% for the five journals as a whole, and 1024 (31.49%) documents cited journals from within the group. A total of 36,972 references were included in documents published in 2015 in the journals. Self-referencing was 6.56% for all journals as a group, and 7524 (20.35%) documents were from the group itself. From the top-20 referenced and citing journals, the presence of plastic and reconstructive surgery, and head and neck (otolaryngology) surgery journals is clear. This pattern was not the same across all the journals under study. Conclusion: There appears to be a “medical *versus* dental” fragmentation of research in the specialty, over a fragmentation by regions or countries.

**Keywords:** Oral and maxillofacial surgeons; research; education; bibliometrics.

### INTRODUCTION.

The history of oral and maxillofacial surgery dates back to the nineteenth century and to the first surgical interventions relating to the oral cavity and face. However, further developments occurred during the First World War. The war conflict forced the collaboration of physicians and dentists to treat wounds of the maxillofacial area.<sup>1,2</sup> Therefore, it is not surprising that the first maxillofacial surgeons had been trained with a double degree, becoming physicians and dentists.<sup>2-4</sup> Also, it is not surprising that plastic surgery and head and neck surgery developed simultaneously into maxillofacial surgery. Many of the pioneering plastic surgeons were dentists and the first plastic surgery association included oral surgeons.<sup>4</sup>

The dual origin of maxillofacial surgery determined that both medicine and dentistry claimed paternity of this specialty. This has resulted in the existence of at least three ways to train oral and maxillofacial surgeons: dental, medical, and dual degrees.<sup>2,5</sup> These ways are associated with historical disputes about the denomination that the specialty must take, prerequisites for starting the training, but especially regarding the scope that an oral and maxillofacial surgeon can or should have.<sup>6,7</sup> This has led to the publication of several studies and letters/editorials advocating one or the other training path, and in some cases the need to standardize the

training of these specialists.<sup>2,8,9</sup>

However, there is a little explored area that relates to how research in oral and maxillofacial surgery is performed.<sup>10</sup> In line with this, currently there are four main maxillofacial journals: *British Journal of Oral and Maxillofacial Surgery (BJOMS)*, *Journal of Oral and Maxillofacial Surgery (JOMS)*, *International Journal of Oral and Maxillofacial Surgery (IJOMS)*, and *Journal of Cranio Maxillofacial Surgery (JCMFS)*. To these four dental/surgical journals we can add *the Journal of Craniofacial Surgery (JCFS)*, which is only considered in the category of surgery. These five journals are the main source of divulgation of research in the specialty. Each of these journals represents, to a greater or lesser extent, organizations and regions (countries) with different training paths (dental, medical, and dual-degree).

Considering the above, it is interesting to assess the patterns of citation of these five journals, looking for differences between them. Thus, the hypothesis of this study is that there are differences in the pattern of citation of the top five journals in maxillofacial surgery. We hypothesize that some journals cite and are cited in a greater proportion by dental journals, but other journals cite and are cited in a greater proportion by medical journals. If the hypothesis is accepted, it would indicate that the research in the specialty is fragmented in a similar way as the training.

Therefore, the aim of this study was to evaluate the input and output citation pattern in the year 2015 for documents published in the five main oral and maxillofacial journals using the Scopus database.

## MATERIALS AND METHODS.

**Design:** Bibliometric study.

**Study population:** Documents indexed in the Scopus database (Elsevier B.V., RELX Group, UK). The timespan analyzed was from 1976 to 2015.

**Selection criteria:** All document types were included, through an advanced search in the Scopus platform (available at: <https://www.scopus.com/search/form.uri>) on September 23, 2016. We included the documents published over the period 2013–2015 by the five main oral and maxillofacial journals: *BJOMS*, *JOMS*, *IJOMS*, *JCMFS* and *JCFS*.

**Procedure and analysis plan:** Citation data was extracted from the advanced search in the Scopus platform (available at: <https://www.scopus.com/search/form.uri>).

We considered the references included by the documents published in 2015; no timespan limit was considered.

We considered the documents published in 2015 that cite documents published in 2013 and 2014 in a similar way as the impact factor (Thomson Reuters, ex ISI) is calculated. A single document account approach was used because we considered only the number of documents citing documents published in 2015, and not the number of citations (*i.e.*: one document can contain two or more citations for a document published in 2015).

For both citations and references we use frequency distribution tables to summarize the 20 most citing or referenced journals.

## RESULTS.

A total of 2303 documents were published by the five main journals in 2015: 274 by *BJOMS*, 469 by *JOMS*, 269 by *IJOMS*, 344 by *JCMFS*, and 947 by *JCFS*.

A total of 3253 documents published in 2015 cited documents published in 2013 and 2014 in the five main journals; these were comprised of 440 by *BJOMS*, 860 by *JOMS*, 576 by *IJOMS*, 620 by *JCMFS*, and 757 by *JCFS*. The distribution of the 20 journals with the greatest citation count is shown in Table 1. The average self-citation was 13.19% for the five journals as a whole: *BJOMS* was 9.55%, *JOMS* was 10.81%, *IJOMS* was 9.20%, *JCMFS* was 24.68%, and *JCFS* was 11.62%. A total of 1024 documents from the group of these journals cited journals from the group itself, representing 31.49% of intra-group self-citation.

A total of 36,972 references were included in documents published in 2015 in the five main journals: 3686 by *BJOMS*, 8333 by *JOMS*, 6650 by *IJOMS*, 8958 by *JCMFS*, and 9345 by *JCFS*. The distribution of the 20 journals with the greatest reference count is shown in Table 2. The average percentage of self-referencing was 6.56% for all journals as a group, *BJOMS* was 9.36%, *JOMS* was 11.50%, *IJOMS* was 5.59%, *JCMFS* was 2.19%, and *JCFS* was 5.95%. A total of 7524 documents from the group of these journals referenced journals from the group itself, representing 20.35% of intra-group self-referencing.

**Table 1.** Distribution of the twenty journals with the greatest citation counts.

Journal's name	BJOMS	JOMS	IJOMS	JCMFS	JCFS	Total
Journal of Cranio Maxillofacial Surgery	47	65	51	153	43	359
Journal of Oral and Maxillofacial Surgery	36	93	31	35	35	230
Journal of Craniofacial Surgery	16	36	16	22	88	178
International Journal of Oral and Maxillofacial Surgery	22	36	53	22	22	155
British Journal of Oral And Maxillofacial Surgery	42	26	16	9	9	102
Oral Surgery Oral Medicine Oral Pathology Oral Radiology and Endodontology	6	17	12	10	4	49
Plastic and Reconstructive Surgery	3	11	0	6	28	48
PLoS One	4	12	10	13	6	45
Oral and Maxillofacial Surgery Clinics of North America	9	20	8	4	3	44
Biomed Research International	4	5	8	5	10	32
American Journal Of Orthodontics and Dentofacial Orthopedics	3	14	8	3	3	31
Clinical Oral Implants Research	1	8	10	5	7	31
Medicina Oral Patologia Oral y Cirugia Bucal	8	4	2	4	8	26
Journal of Oral and Maxillofacial Surgery Medicine And Pathology	3	5	5	7	5	25
Journal of Plastic Reconstructive and Aesthetic Surgery	6	0	2	4	13	25
Current Opinion in Otolaryngology and Head and Neck Surgery	8	4	4	2	5	23
Facial Plastic Surgery	3	5	4	4	6	22
Microsurgery	3	5	0	5	8	21
International Journal of Clinical and Experimental Medicine	2	2	0	5	11	20
Aesthetic Plastic Surgery	1	3	1	5	9	19

JCMFS: Journal of Cranio Maxillofacial Surgery, BJOMS: British Journal of Oral and Maxillofacial Surgery, JOMS: Journal of Oral and Maxillofacial Surgery, IJOMS: International Journal of Oral and Maxillofacial Surgery, JCFS: Journal of Craniofacial Surgery.

**Table2.** Distribution of the twenty journals with the greatest citation counts.

Journal's name	BJOMS	JOMS	IJOMS	JCMFS	JCFS	Total
Journal of Oral and Maxillofacial Surgery	276	958	642	715	407	2998
Plastic and Reconstructive Surgery	128	316	175	453	772	1844
International Journal of Oral and Maxillofacial Surgery	163	303	372	338	188	1364
Journal of Craniofacial Surgery	60	148	175	257	556	1196
Oral Surgery Oral Medicine Oral Pathology Oral Radiology and Endodontology	114	342	239	265	147	1107
British Journal of Oral and Maxillofacial Surgery	345	198	165	196	120	1024
Journal of Cranio Maxillofacial Surgery	60	163	138	468	113	942
American Journal of Orthodontics and Dentofacial Orthopedics	42	100	83	101	92	418
Clinical Oral Implants Research	35	108	165	118	34	460
Laryngoscope	42	87	67	107	134	437
Cleft Palate Craniofacial Journal	16	29	28	163	133	369
Head and Neck	47	84	50	111	51	343
Oral Oncology	52	75	80	107	19	333
Annals of Plastic Surgery	18	54	35	68	154	329
Otolaryngology Head and Neck Surgery	24	42	32	48	70	216
International Journal Of Oral and Maxillofacial Implants	13	43	98	49	24	227
Archives of Otolaryngology Head and Neck Surgery	29	47	32	63	55	226
Journal of Plastic Reconstructive and Aesthetic Surgery	24	37	19	52	87	219
British Journal of Plastic Surgery	20	45	18	49	71	203
Journal of Neurosurgery	0	16	11	20	152	199

JCMFS: Journal of Cranio Maxillofacial Surgery, BJOMS: British Journal of Oral and Maxillofacial Surgery, JOMS: Journal of Oral and Maxillofacial Surgery, IJOMS: International Journal of Oral and Maxillofacial Surgery, JCFS: Journal of Craniofacial Surgery.

## DISCUSSION.

Our study aim was to evaluate the input and output citation pattern in the year 2015 for documents published in the five main oral and maxillofacial journals using the Scopus database.

The results of this study show a concentration of the maxillofacial research within these five journals. *JOMS* can be considered as the core journal of the specialty; it has the highest referencing total count and the second highest citation total count.

However, the concentration around these five journals is not as strong as we expected. In fact, just one-third of citing documents were published in this group of journals, and one-fifth in the case of referenced ones.

In addition, in the top-20 referenced and citing journal rankings the presence of plastic and reconstructive surgery, and head and neck (otolaryngology) surgery journals is clear. This pattern reminds us of the common origin and similar scope of these three specialties.<sup>4</sup> Nevertheless, this pattern was not the same across all the journals under study.

Analyzing the citation count of the five main maxillofacial journals shows that *JOMS* attracts 20 citations from *Oral and Maxillofacial Surgery Clinics of North America (OMSCNA)*, but *JCFS* attracts only three citations from this journal. This is interesting, because *JOMS* and *OMSCNA* are considered dental/surgical journals, but *JCFS* is a medical/surgical one. This implies that in a dental/surgical journal such as *OMSCNA* it is preferred to cite a journal of the same nature rather than a medical/surgical one. It is also interesting to note that these three journals are based in the USA, so the fragmentation of research in the specialty would be “dental *versus* medical” rather than according to region or country.

In a similar way, the citations coming from *Plastic and Reconstructive Surgery (PRS)*, which is a medical/surgical journal, are concentrated on other medical/surgical journals such as the *JCFS*. A very similar situation occurs with two other *plastic surgery journals*, *Aesthetic Plastic Surgery*, and *the Journal of Plastic Reconstructive and Aesthetic Surgery*. *IJOMS* (dental/surgical) has no citations from *PRS*. This reinforces the idea that there is a specialty fragmentation according to the nature of the journal, be it medical or dental.

When we analyze the referencing pattern of the maxil-

lofacial journals, we see almost the same behavior already described for the citing pattern.

The highest referencing count from *JCFS* goes to *PRS* and to *JCFS* itself. The journal with the second highest referencing is *JCMFS*; we must note that *JCMFS* represents *the European Association for Cranio-Maxillofacial Surgery*, where the training is mostly medical-based or dual-degree-based. The second journal with the greater referencing count to *PRS* is *JOMS*, with both journals based in the USA. When we see the referencing count to the journal *Laryngoscope*, the same pattern is apparent, with a greater referencing count from *JCFS*, *JCMFS* and *JOMS*, and with fewer references from *BJOMS* and *IJOMS*.

Nevertheless, there are some exceptions to the patterns described above, *i.e.* *the American Journal of Orthodontics and Dentofacial Orthopedics (AJODO)*, a dental (not surgically focused) journal, has a higher referencing count from *JCFS*, *JCMFS* and *JOMS*. On the other hand, *the Clinical Oral Implants Research*, a dental journal, has a higher referencing count from *IJOMS*, *JCMFS* and *JOMS*. This implies that some aspects of maxillofacial research are clearly dentally based (orthodontics and dental implants), so the nature of the journal (dental, medical or dual) has no influence on these specific topics.

Some limitations must be considered: this study only analyzed the year 2015, so these results are not representative of the historical situation of oral and maxillofacial surgery research. Furthermore, only five oral and maxillofacial surgery journals were included in the analysis, but there are many other indexed journals publishing case reports, reviews, and articles related to oral and maxillofacial surgery.

Despite the above, there are no strong reasons to think that the situation in other years or journals would be different from that reported for these five journals for the year 2015.

## CONCLUSION.

Using the Scopus database, the input and output citation pattern in the year 2015 for documents published in the five main oral and maxillofacial journals shows some signs of a “medical *versus* dental” fragmentation of research in the specialty, over a fragmentation by regions or countries.

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