



Top 100 cited systematic reviews and meta-analyses in the major journals of oral and maxillofacial surgery: a bibliometric analysis

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Abstract

The aim of this bibliometric research was to identify and analyze the top 100 cited systematic reviews in the field of oral and maxillofacial surgery in order to guide any professional level with interest in this topic and to map the current trends the field of oral and maxillofacial surgery. Using the Web of Science database without restrictions on publication year or language, a bibliometric analysis was performed for the five major journals of oral and maxillofacial surgery: International Journal of Oral and Maxillofacial Surgery (IJOMS), Journal of Oral and Maxillofacial Surgery (JOMS), Journal of Cranio-maxillofacial Surgery (JCMS), British Journal of Oral & Maxillofacial Surgery (BJOMS), and Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology (Triple-O). The most top-cited systematic review was published in 2015 with a total of 200 citations on survival and success rates of dental implants, consistent with the finding that “pre- and peri-implant surgery and dental implantology,” and “craniomaxillofacial deformities and cosmetic surgery” were the most frequently cited topics (22% each). The majority of top cited papers were published in IJOMS (43%), followed by JOMS (34%), Triple-O (8%), JCMS(8%) and BJOMS(7%). The highest number of contributions was from the Netherlands, followed by Italy and USA. The outcome of this article can be used as a source of information and to guide not just researchers but also clinicians and students to which areas are trending in the field of oral and maxillofacial surgery, thus also having a large impact on the field of oral and maxillofacial surgery. However, this article cannot reflect the quality of the included systematic reviews.

Keywords Bibliometrics · Citation analysis · Oral and maxillofacial surgery · Systemic reviews · Meta-analysis

Background

Decision making regarding all clinical decisions including choice of treatment is nowadays nationally and internationally based on evidence-based medicine in all fields of medicine such as dentistry and oral and maxillofacial

surgery (OMFS) [1, 2]. Randomized controlled trials (RCTs) have been considered the best and strongest study design to answer a specific clinical question, consequently being a guide to the decision making, described as an evidence-based approach. However, in most of the RCTs, a huge sample size is warranted to reach an outcome based on reliable statistics. Performing a RCT with a big sample size is a challenge for any researcher. Systematic reviews with meta-analysis allow combining data from individual RCTs in order to reach a more robust and reliable conclusion regarding a clinical question. Besides that, there are tools to evaluate the quality of RCTs, in order to be able to do recommendations about this specific clinical issue. Therefore, presently systematic reviews and meta-analysis are graded with the highest quality level study design [3]. Furthermore, studies have indicated that dentists often are either unable or unwilling to access or read primary evidence [4]. There are also indications that Cochrane systematic reviews are not as cited and popular as systematic reviews in high impact journals. This

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finding is surprising since the Cochrane systematic reviews are commonly considered gold standard, but one explanation could be the reporting format that is difficult to read and also presented as boring [5]. Therefore, summaries of evidence such as systematic reviews and clinical guidelines could be an easy way to implement evidence-based dentistry in the clinical practice [6].

Another type of research, used to show what impact publications have, is called “bibliometrics.” The first citation about bibliometrics was done by Pritchard in 1969 [7]. There are some publications on bibliometric analysis in the field of OMSF, but specified as facial trauma [8], oral cancer [9], and maxillofacial surgery [10]. The citation analysis is a type of bibliometrics which quantifies how many times a publication has been cited after its publication. This information can be efficient to use in order to evaluate what impact a publication has in a specific field, and therefore how important this publication is in that specific field. Thus, the more cited the publication is, the greater impact it has [11]. On the other hand, there are evidence indicating that errors in the cited “facts” can be perpetuated with repeated citations which can influence practice and policy negatively [12]. Furthermore, for dentists and clinicians already using evidence-based dentistry in their clinical practice, this analysis can be seen as an important tool to guide the clinicians to identify the publications with the greatest impact in their field of action, and thus use them as a guide in their decision making.

After the year 2000, there was a huge increase in the number of published systematic reviews in medicine and dentistry. Specifically, in the field of OMFS, an increase of published systematic reviews was observed after the year 2010. To our knowledge, there are no studies aiming to investigate the most-cited systematic reviews in the field of OMFS. Thus, after 10 years of worldwide research, it is imperative to know how the direction of the research in the field of OMFS, to see how the field of OMFS has been transformed and/or affected by investigating the bibliometrics of the systematic reviews, by ranking the most-cited systematic reviews in order to both provide the direction of the research in the field of OMFS, and also as a guidance for the clinicians regarding their acquisition of knowledge from a solid evidence-based aspect. The aim of this bibliometric research was therefore to identify and analyze the top 100 cited systematic reviews in the field of OMFS in order to guide any professional level with interest in this topic and to map the current trends the field OMFS.

Methods

Using the methodology outlined in the bibliometric analysis of top 100 cited paper in a previous study [13], the authors performed a bibliometric analysis of the top 100 most highly cited systematic reviews. The five top journals in the specific field of oral and maxillofacial surgery with impact factor above 1.0 which publishes systematic reviews frequently were chosen (International Journal of Oral and Maxillofacial Surgery (IJOMS), Journal of Oral and Maxillofacial Surgery (JOMS), Journal of Cranio-maxillofacial Surgery (JCMS), British Journal of Oral & Maxillofacial Surgery (BJOMS), and Oral Surgery Oral medicine Oral pathology Oral radiology (TRIPLEO). A search was performed on October 29, 2020, using the Clarivate Analytics’ Web of Science database and there was no restriction on the publication year or the language of the manuscripts. The search strategy was “systematic review” OR “systematic reviews” OR “meta-analysis” OR “meta-analyses.” The results were organized in descending order of citation count.

After the search the Clarivate Analytics’ Web of Science database, the 100 most-cited articles were stratified in categories based on the content. Ten categories could be found in the stratification process and they were as follows: dentoalveolar surgery, pre-implant surgery and dental implantology, traumatology, craniomaxillofacial deformities and cosmetic surgery, osteonecrosis of the jaws, pathology, reconstructive surgery, temporomandibular joint (TMJ), basic science research, and emerging technologies.

The most-cited articles were analyzed regarding the following information retrieved from the Clarivate Analytics’ Web of Science database: number of citations, publication year, journals, authors, number of authors, methodological design (systematic review or systematic review with meta-analysis), article field (dentoalveolar surgery, pre-implant surgery and dental implantology, traumatology, craniomaxillofacial deformities and cosmetic surgery, osteonecrosis of the jaws, pathology, reconstructive surgery, temporomandibular joint (TMJ), basic science research, and emerging technologies), contributing institution and country. The country of origin and contributing institution of the article was defined by the address provided for the corresponding author. When the paper presented, the same citation number the most recent was best ranked.

Number of articles and citations per article were graphed using the Statistical Package for the Social Sciences software (SPSS version 22.0).

Results

The initial search identified 771 articles. The 100 top-cited systematic reviews on the OMFS field are listed by rank order based on the number of citations in Table 1. From a total of 100 systematic reviews only 37 presented meta-analyses. The number of authors ranged between one and 16 (mean 4.12 ± 2.31).

These articles have been cited a combined total of 5107 times. The top-cited article was published in 2015 with a total of 200 citations [14], but only 7 articles reached to 100 citations (Table 1). Based on the distribution of the 100 articles over the years and their citations per publication, the years 2000 followed by 2006 and 2007 were the most productive years (Fig. 1). The earliest systematic review included in this bibliometric analysis was published in 2000 by Lee et al. [15], in JOMS and has been cited 98 times, while the most recently was published in 2018 by Starch-Jensen et al. [16] in the IJOMS and has been cited 33 times. Figure 2 illustrates the distribution of the 100 articles over the years.

The fields “pre- and peri-implant surgery and dental implantology,” as well as “craniofacial deformities and cosmetic surgery” were the most frequently cited topics (22% each) in the top 100 list (Fig. 3). The first field has a total of 1334 citations while the second topic has a total of 1162 citations.

There were 25 different countries of origin and 83 institutions responsible for the highly cited systematic reviews. The leading countries were the Netherlands and Italy with 12 manuscripts each, followed by the USA with 10 articles (Fig. 4).

Overall, IJOMS was responsible for 2481 citations, JOMS for 1684, TRIPLEO for 380 citations, JCMFS for 307, and BJOMS for 255. The mean citation rate per published review followed the same pattern with IJOMS having a mean citation rate of 57.7 citations per review, JOMS 49.5 citations per review, TRIPLEO 47.5 citations per review, JCMFS 38.4 citations per review, and BJOMS 31.9 citations per review. Most of the manuscripts were published in the IJOMS and JOMS (Fig. 5).

Discussion

In the field of (dental)medicine, as in the other fields of science, the scientists strive to reach out with their research findings. In other words, they wish that their findings both can be used to affect decisions, and also to guide the readers in their decision making [12]. Articles reaching more than 100 citations are considered classic, i.e., having

a great impact [17]. However, to analyze and understand if the conducted research has any impact or affects decision making one has to analyze how and if the articles do reach out, and what impact they have in their research filed [17]. To do that scientometrics, which is bibliometry in the field of science, is frequently used. This study used citation analysis [18], to identify the publications that have had the greatest impact in the field of OMFS. Although the field of OMFS is very wide, with diverse conditions and treatments, the main finding of this citation analysis indicates that there were only 7 systematic reviews that reached to 100 citations in the field of OMFS, among the included journals. This is in line with previous studies indicating that less than 10% of the published articles reaches up to the status of classic articles [19–21].

Among the classic articles, the top-cited article was an Italian systematic review on longitudinal studies about the evaluation of survival and success rates of dental implants [14], published in 2015 but already up in 200 citations. Among top three, there was one more systematic review on dental implants also from Italy focusing on different alveolar bone augmentation procedures for implant placement [22], published in 2014 and has now reached 124 citations. It is not surprising that systematic reviews upon dental treatments are top ranked since dental implant surgery is the vast most common surgical procedure next to tooth extractions, in contrast to orthognathic surgery, tumors [23].

The second most cited was also a European (from the Netherlands) systematic review on three-dimensional image fusion processes for planning and evaluating orthodontics and orthognathic surgery, published in 2011 having 131 citations. All top-three systematic reviews were published in IJOMS, which is the top journal in the field of OMFS, being ranked in the second quartile (QR2), Clarivate Analytics' Web of Science database. It has been shown that the journal impact factor answers for 59% of the variation in the number of citations [24]. Therefore, it is not at surprising finding since most authors are interested in publishing papers in journals with high impact factors, which also is considered an indication of high quality papers [25, 26]. Just outside top-three systematic reviews, this citation analysis could show that systematic reviews upon osteoradionecrosis from Hong Kong (112 citations) [27] and Malaysia (100 citations) [28], as well as osteonecrosis from Germany (104 citations) [29]. The same fields were also dominating the rest of the most highly cited systematic reviews.

It has previously been reported that the majority of the top-ranked, top-cited publications are produced in nations with better economic rankings [21, 30]. This was also found in this citation analysis indicating that most of the systematic reviews in the field of OMFS are produced in Europe and the USA, as well as Hong Kong, with Italy as the most successful country.

Table 1 The top 100 cited systematic review and meta-analyses in oral and maxillofacial surgery

Rank	Author	Title	Publication year	Journal	Institution	Citations
1	Moraschini V et al	Evaluation of survival and success rates of dental implants reported in longitudinal studies with a follow-up period of at least 10 years: a systematic review	2015	IJOMS	Fluminense Federal University	200
2	Plooj JM et al	Digital three-dimensional image fusion processes for planning and evaluating orthodontics and orthognathic surgery. A systematic review	2011	IJOMS	3D Facial Imaging Research Group Nijmegen-Bruges	131
3	Milinkovic I et al	Are there specific indications for the different alveolar bone augmentation procedures for implant placement? A systematic review	2014	IJOMS	Eastman Dental Hospital	124
4	Milinkovic I, Cordaro L	Incidence and prevention of osteoradionecrosis after dental extraction in irradiated patients: a systematic review	2011	IJOMS	University of Hong Kong	112
5	Nabil S, Samman N	Stability After Bilateral Sagittal Split Osteotomy Advancement Surgery With Rigid Internal Fixation: A Systematic Review	2009	JOMS	University of Geneva	107
6	Joss CU, Vassalli IM	Treatment strategies and outcomes of bisphosphonate-related osteonecrosis of the jaw (BRONJ) with characterization of patients: a systematic review	2015	IJOMS	Universitat Munich	104
7	Nabil S, Samman N	Risk factors for osteoradionecrosis after head and neck radiation: a systematic review	2012	TRIPLEO	National University of Malaysia	100
8	Lee JJ et al	Survival of hydroxyapatite-coated implants: A meta-analytic review	2000	JOMS	University of Washington	98
9	Cheung LK, Chua HDP	A meta-analysis of cleft maxillary osteotomy and distraction osteogenesis	2006	IJOMS	The University of Hong Kong	97
10	Lau SL, Samman N	Recurrence related to treatment modalities of unicystic ameloblastoma: a systematic review	2006	IJOMS	The University of Hong Kong	96
11	Colella G et al	Fine-Needle Aspiration Cytology of Salivary Gland Lesions: A Systematic Review	2010	JOMS	Second University of Naples	91
12	Clementini M et al	Success rate of dental implants inserted in horizontal and vertical guided bone regenerated areas: a systematic review	2012	IJOMS	University Tor Vergata	90
13	Ren YF, Malmstrom HS	Effectiveness of antibiotic prophylaxis in third molar surgery: A meta-analysis of randomized controlled clinical trials	2007	JOMS	University of Rochester	89
14	Stokbro K et al	Virtual planning in orthognathic surgery	2014	IJOMS	Odense University Hospital	88
15	Rickert D et al	Maxillary sinus lift with solely autogenous bone compared to a combination of autogenous bone and growth factors or (solely) bone substitutes. A systematic review	2012	IJOMS	University Medical Center Groningen	78
16	Goiato MC et al	Longevity of dental implants in type IV bone: a systematic review	2014	IJOMS	Universidade Estadual Paulista	76

Table 1 (continued)

Rank	Author	Title	Publication year	Journal	Institution	Citations
17	Markiewicz MR et al	Corticosteroids reduce postoperative morbidity after third molar surgery: A systematic review and meta-analysis	2008	JOMS	Oregon Health and Science University	76
18	Merkx MAW et al	Assessment of the value of anorganic bone additives in sinus floor augmentation: a review of clinical reports	2003	IJOMS	University of Nijmegen	71
19	Colella G et al	Neurosensory disturbance of the inferior alveolar nerve after bilateral sagittal split osteotomy: A systematic review	2007	JOMS	Second University of Naples	68
20	Soh CL, Narayanan V	Quality of life assessment in patients with dentofacial deformity undergoing orthognathic surgery-A systematic review	2013	IJOMS	Saveetha University, Vellappanchavadi	63
21	Clementini M et al	Systemic risk factors for peri-implant bone loss: a systematic review and meta-analysis	2014	IJOMS	Independent Researcher	60
22	Kaczmarzyk T et al	A systematic review of the recurrence rate for keratocystic odontogenic tumour in relation to treatment modalities	2012	IJOMS	Jagiellonian University Medical College	59
23	Andreassen JO et al	A systematic review of prophylactic antibiotics in the surgical treatment of maxillofacial fractures	2006	JOMS	University Hospital (Rigshospitalet)	59
24	Gunarajah DR, Samman N	Biomaterials for Repair of Orbital Floor Blowout Fractures: A Systematic Review	2013	JOMS	University of Hong Kong	57
25	Kaipatur NR, Flores-Mir C	Accuracy of Computer Programs in Predicting Orthognathic Surgery Soft Tissue Response	2009	JOMS	University of Alberta	56
26	Dan AEB et al	Corticosteroid Administration in Oral and Orthognathic Surgery: A Systematic Review of the Literature and Meta-Analysis	2010	JOMS	University of Copenhagen	54
27	Al-Moraissi EA, Ellis, E	Surgical Treatment of Adult Mandibular Condylar Fractures Provides Better Outcomes Than Closed Treatment: A Systematic Review and Meta-Analysis	2015	JOMS	Thamar University	53
28	Mattos CT et al	Effects of orthognathic surgery on oropharyngeal airway: a meta-analysis	2011	IJOMS	Federal University of Rio de Janeiro	53
29	Mohlhenrich SC et al	Heat generation and drill wear during dental implant site preparation: systematic review	2015	BJOMS	Aachen University Hospital	51
30	Boffano P et al	Aetiology of maxillofacial fractures: a review of published studies during the last 30 years	2014	BJOMS	University of Amsterdam	51
31	Van Diermen DE et al	Management recommendations for invasive dental treatment in patients using oral antithrombotic medication, including novel oral anticoagulants	2013	TRIPLEO	Academic Centre for Dentistry Amsterdam	51
32	Reston JT, Turkelson CM	Meta-analysis of surgical treatments for temporomandibular articular disorders	2003	JOMS	Department of Health Technology Assessment, ECRI	51
33	Johnson NR et al	Management and recurrence of keratocystic odontogenic tumor: a systematic review	2013	TRIPLEO	MBBS Maxillofacial Department	50

Table 1 (continued)

Rank	Author	Title	Publication year	Journal	Institution	Citations
34	Pineiro-Aguilar A et al	Blood Loss in Orthognathic Surgery: A Systematic Review	2011	JOMS	University of Santiago de Compostela	50
35	Markiewicz MR et al	Morbidity associated with oral mucosa harvest for urological reconstruction: An overview	2008	JOMS	University at Buffalo	49
36	Saulacic N et al	Alveolar distraction osteogenesis: a systematic review	2008	IMOS	University of Bern	48
37	Chrcanovic BR et al	Survival and Complications of Zygomatic Implants: An Updated Systematic Review	2016	JOMS	Malmö University	47
38	Joss CU, Vassalli IM	Stability after bilateral sagittal split osteotomy setback surgery with rigid internal fixation: A systematic review	2016	JOMS	University of Geneva, Geneva	47
39	Akadiri OA, Obiechina AE	Assessment of Difficulty in Third Molar Surgery-A Systematic Review	2008	JOMS	University of PortHarcourt	46
40	Nussbaum ML et al	Closed versus open reduction of mandibular condylar fractures in adults: A meta-analysis	2009	JOMS	Virginia Commonwealth University	46
41	Saridin CP et al	Bone scintigraphy as a diagnostic method in unilateral hyperactivity of the mandibular condyles: a review and meta-analysis of the literature	2011	IMOS	VU University Medical	46
42	Troeltzsch M et al	Clinical efficacy of grafting materials in alveolar ridge augmentation: A systematic reviewClinical efficacy of grafting materials in alveolar ridge augmentation: A systematic review	2016	JCMS	University of Goettingen	45
43	Kyzas PA et al	The treatment of mandibular condyle fractures: A meta-analysis	2012	JCMS	North Manchester General Hospital	45
44	Del Fabbro M et al	Is autologous platelet concentrate beneficial for post-extraction socket healing? A systematic review	2011	IMOS	University of Milan	45
45	Stableforth WD et al	A systematic review of the role of immunonutrition in patients undergoing surgery for head and neck cancer	2009	IMOS	Derriford Hospital	45
46	Khojasteh A et al	Effects of different growth factors and carriers on bone regeneration: a systematic review	2013	TRIPLEO	Shahid Beheshti University of Medical Sciences	44
47	Jensen T et al	Maxillary sinus floor augmentation with Bio-Oss or Bio-Oss mixed with autogenous bone as graft in animals: a systematic review	2012	IMOS	Aarhus University Hospital	44
48	Verstraaten J et al	A systematic review of the effects of bone-borne surgical assisted rapid maxillary expansion	2010	JCMS	Radboud University Nijmegen Medical Centre	44
49	Atieh MA	Diagnostic Accuracy of Panoramic Radiography in Determining Relationship Between Inferior Alveolar Nerve and Mandibular Third Molar	2010	JOMS	University of Otago	43
50	Dubois L et al	Controversies in orbital reconstruction-I. Defect-driven orbital reconstruction: A systematic review	2015	IMOS	University of Amsterdam	42

Table 1 (continued)

Rank	Author	Title	Publication year	Journal	Institution	Citations
51	Agostini T et al	Anterolateral thigh flap: Systematic literature review of specific donor-site complications and their management	2013	JCMS	CTO-AOUC, Department of Traumatology and Maxillofacial Surger	42
52	Pirklbauer K et al	Maxillomandibular Advancement for Treatment of Obstructive Sleep Apnea Syndrome: A Systematic Review	2011	JOMS	Medical University of Vienna	41
53	Moraschini V, Barboza EDP	Success of dental implants in smokers and non-smokers: a systematic review and meta-analysis	2016	IMOS	Fluminense Federal University	41
54	Foresta E et al	Pleomorphic adenoma and benign parotid tumors: extracapsular dissection vs superficial parotidectomy- review of literature and meta-analysis	2014	TRIPLEO	Catholic University Medical School	41
55	Pluijmers et al	Mandibular reconstruction in the growing patient with unilateral craniofacial microsomia: a systematic review	2014	IMOS	Erasmus University Medical Center	40
56	Guarda-Nardini L et al	Synovial chondromatosis of the temporomandibular joint: a case description with systematic literature review	2010	IMOS	University of Padova	40
57	Kelly MP et al	Systematic Review and Meta-Analysis of Recombinant Human Bone Morphogenetic Protein-2 in Localized Alveolar Ridge and Maxillary Sinus Augmentation	2016	JOMS	University of Wisconsin School of Medicine and Public Health	39
58	Brignardello-Petersen R et al	Is Adjuvant Laser Therapy Effective for Preventing Pain, Swelling, and Trismus After Surgical Removal of Impacted Mandibular Third Molars? A Systematic Review and Meta-Analysis	2012	JOMS	University of Toronto, Toronto	39
59	Dubois L et al	Controversies in orbital reconstruction-II. Timing of post-traumatic orbital reconstruction: A systematic review	2015	IMOS	University of Amsterdam	39
60	Goiato MC et al	Implants in the zygomatic bone for maxillary prosthetic rehabilitation: a systematic review	2014	IMOS	Araçatuba Dental School UNESP	39
61	Ata-Ali J et al	Do antibiotics decrease implant failure and postoperative infections? A systematic review and meta-analysis	2014	IMOS	Valencia University	39
62	Brown JS et al	Systematic review of the current evidence in the use of postoperative radiotherapy for oral squamous cell carcinoma	2012	BJOMS	University Hospital AintreeLowerLane	39
63	Klug C et al	Preoperative chemoradiotherapy in the management of oral cancer: A review	2008	JCMS	Medical University of Vienna	39
64	Katsnelson A et al	Operative Management of Temporomandibular Joint Ankylosis: A Systematic Review and Meta-Analysis	2012	JOMS	Harvard School of Dental Medicine	36
65	Kyzas PA	Use of Antibiotics in the Treatment of Mandible Fractures: A Systematic Review	2011	JOMS	Blackburn Royal Infirmary	36

Table 1 (continued)

Rank	Author	Title	Publication year	Journal	Institution	Citations
66	Patterson BM et al	Corticotomies and Orthodontic Tooth Movement: A Systematic Review	2016	JOMS	University of Sydney	35
67	Moraschini V et al	Implant survival rates, marginal bone level changes, and complications in full-mouth rehabilitation with flapless computer-guided surgery: a systematic review and meta-analysis	2015	IMOS	Fluminense Federal University	35
68	Chrcanovic BR et al	Immediately loaded non-submerged versus delayed loaded submerged dental implants: A meta-analysis	2015	IMOS	Malmö University	35
69	Tsui WK et al	Bone anchor systems for orthodontic application: a systematic review	2012	IMOS	University of Hong Kong	35
70	Azarmehr I et al	Surgical Navigation: A Systematic Review of Indications, Treatments, and Outcomes in Oral and Maxillofacial Surgery	2017	JOMS	Odense University Hospital	34
71	Aliko A et al	World Workshop on Oral Medicine VI: clinical implications of medication-induced salivary gland dysfunction	2015	TRIPLEO	Tel-Aviv Sourasky Medical Center and Saliwell	34
72	Raijmakers PG et al	Female Predominance and Effect of Gender on Unilateral Condylar Hyperplasia: A Review and Meta-Analysis	2012	JOMS	VU University Medical Centre, de Boelelaan	33
73	Rachidi S; et al	Melanotic Neuroectodermal Tumor of Infancy: A Systematic Review	2015	JOMS	Medical University of South Carolina	33
74	Starch-Jensen T; et al	A systematic review and meta-analysis of long-term studies (five or more years) assessing maxillary sinus floor augmentation	2018	IMOS	Aalborg University Hospital	33
75	Pocaterra A. et al	Effectiveness of platelet-rich plasma as an adjunctive material to bone graft: a systematic review and meta-analysis of randomized controlled clinical trials	2016	IMOS	University of L'Aquila	33
76	Al-Moraissi EA et al	A systematic review and meta-analysis of the clinical outcomes for various surgical modalities in the management of temporomandibular joint ankylosis	2015	IMOS	Thamar University	33
77	Haas OL et al	Computer-aided planning in orthognathic surgery-systematic review	2015	IMOS	Pontifical Catholic University of Rio Grande do Sul	33
78	Lovelace TL et al	Management of radiotherapy-induced salivary hypofunction and consequent xerostomia in patients with oral or head and neck cancer: meta-analysis and literature review	2014	TRIPLEO	Medical University of South Carolina	33
79	Saltaji H et al	Maxillary Advancement With Conventional Orthognathic Surgery in Patients With Cleft Lip and Palate: Is It a Stable Technique?	2012	JOMS	University of Alberta	32

Table 1 (continued)

Rank	Author	Title	Publication year	Journal	Institution	Citations
80	Tarsitano A et al	Mandibular reconstructions using computer-aided design/computer-aided manufacturing: A systematic review of a defect-based reconstructive algorithm	2015	JCMS	University of Bologna	32
81	Adeyemo WL, Akadiri OA	A systematic review of the diagnostic role of ultrasonography in maxillofacial fractures	2011	IJOMS	University of Lagos	32
82	Agbaje JO et al	Systematic review of the incidence of inferior alveolar nerve injury in bilateral sagittal split osteotomy and the assessment of neurosensory disturbances	2015	IJOMS	Catholic University Leuven	31
83	Hsieh YJ, Liao YF	Effects of maxillomandibular advancement on the upper airway and surrounding structures in patients with obstructive sleep apnoea: a systematic review	2013	BJOMS	Chang Gung Memorial Hospital	31
84	Molina-Solana R et al	Current concepts on the effect of environmental factors on cleft lip and palate	2013	IJOMS	University of Seville	31
85	Al-Moraissi EA, Ellis E	What Method for Management of Unilateral Mandibular Angle Fractures Has the Lowest Rate of Postoperative Complications? A Systematic Review and Meta-Analysis	2014	JOMS	Thamar University	30
86	Al-Moraissi EA et al	What surgical treatment has the lowest recurrence rate following the management of keratocystic odontogenic tumor?: A large systematic review and meta-analysis	2017	JCMS	Thamar University	30
87	Antonoglou GN, Sandor GK	Recurrence rates of intraosseous ameloblastomas of the jaws: A systematic review of conservative versus aggressive treatment approaches and meta-analysis of non-randomized studies	2015	JCMS	University of Oulu	30
88	Shah KSV, Ethunandan M	Tumour seeding after fine-needle aspiration and core biopsy of the head and neck—a systematic review	2016	BJOMS	University Hospitals Southampton	29
89	Breik O et al	Mandibular distraction osteogenesis for the management of upper airway obstruction in children with micrognathia: a systematic review	2016	IJOMS	Royal Melbourne Hospital	29
90	Clementini M et al	Immediate versus delayed positioning of dental implants in guided bone regeneration or onlay graft regenerated areas: a systematic review	2013	IJOMS	University “Tor Vergata”	29
91	Saltaji H et al	Le Fort III Distraction Osteogenesis Versus Conventional Le Fort III Osteotomy in Correction of Syndromic Midfacial Hypoplasia: A Systematic Review	2014	JOMS	University of Alberta	28
92	Moraschini V et al	Effect of autologous platelet concentrates for alveolar socket preservation: a systematic review	2015	IJOMS	Fluminense Federal University	28
93	Almeida RDC; et al	Recurrence rate following treatment for primary multicystic ameloblastoma: systematic review and meta-analysis	2016	IJOMS	University of Pernambuco	27

Table 1 (continued)

Rank	Author	Title	Publication year	Journal	Institution	Citations
94	Langton S et al	Two-week rule in head and neck cancer 2000–14: a systematic review	2016	BJOMS	Royal Blackburn Hospital	27
95	Atienza G, Lopez-Cedrun JL	Management of obstructive salivary disorders by sialendoscopy: a systematic review	2015	BJOMS	Galician Agency for Health Technology Assessment	27
96	Taylor J et al	World Workshop on Oral Medicine VI: a systematic review of the treatment of mucous membrane pemphigoid	2015	TRIPLEO	New York University College of Dentistry	27
97	Voulgarakis A et al	Outcomes of implants placed with three different flapless surgical procedures: A systematic review	2014	IMOS	University Hospital of Freiburg	27
98	Li CJ et al	Ultrasonography for Detection of Disc Displacement of Temporomandibular Joint: A Systematic Review and Meta-Analysis	2012	JOMS	Sichuan University	27
99	Leung YY et al	Treatment Modalities of Neurosensory Deficit After Lower Third Molar Surgery: A Systematic Review	2012	JOMS	Prince Philip Dental Hospital	27
100	Joss CU et al	Soft Tissue Profile Changes After Bilateral Sagittal Split Osteotomy for Mandibular Setback: A Systematic Review	2010	JOMS	Radboud University	27

One interesting factor is that the top-ranked systematic reviews are all published after the year 2010, however not surprising since only 14 out of the 100 top-cited were published in the decade 2000–2010. One common criticism on citation analysis reports is that the outcome is affected by the impact of time [19]. This was, however, not the case in this report on the field of OMFS. In accordance with our results, previous studies have indicated that there are just a few citations the first years, with a peak of citations just before an article age of 10 years [31].

Another aspect to consider is that citation analysis only can be used to assess the impact the specific article has on its field by quantifying its recognition, the importance as well as the popularity of the topic, and also perhaps how common or severe a condition might be, but it cannot reflect the quality of the content in the article [25, 26]. Therefore, it is of great importance to use the outcome of this article as a source of information not just for researchers but also for clinicians and students, regarding which areas and to guide readers at any professional level with interest in this field to which areas are trending, thus also having a large impact on the field of OMFS. However, although scientists wish that their research findings can be used to affect decisions, and to guide the clinicians in their decision making [12], one also has to take into consideration that this is not the case in dentistry. It has recently been shown that although the majority of dentists are aware of the term and meaning of evidence-based dentistry, they do not necessarily seem to apply evidence-based dentistry in their practice [6]. This could be seen as a drawback regarding evidence-based dentistry in clinical practice. Therefore, clear, easy-to-read summaries of evidence such as systematic reviews and clinical guidelines could be an easy way to implement evidence-based dentistry in the clinical practice [6].

There are some limitations that could be considered. One is that this article only evaluated the five top journals in the specific field of OMFS with impact factor above 1.0. This could consequently result in that many other excellent review articles concerning the field of OMFS but published in other journals, i.e., in other languages or from other fields of dentistry/medicine are lacking. However, as shown in this analysis the included articles were from entire world, but the majority of the most cited were from countries with better economic rankings [21, 30]. Furthermore, this article could also show that most of the most-cited papers were in journals with higher impact factors, which was not surprising since most authors are interested in publishing papers

Fig. 1 Number of citations per systematic review by year in OMFS

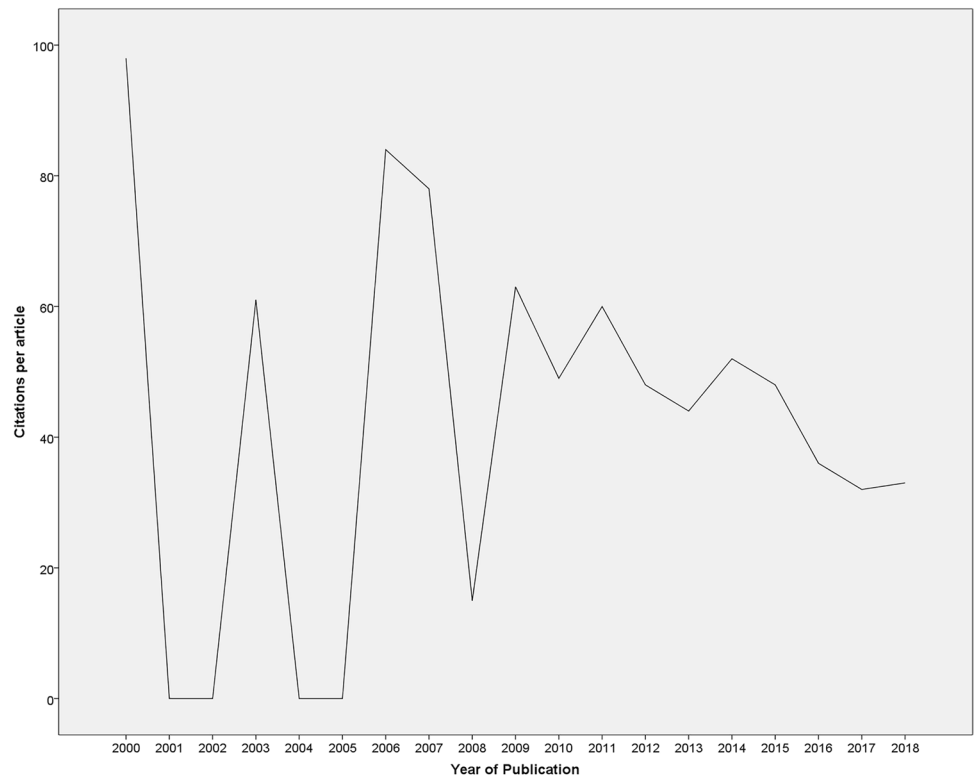
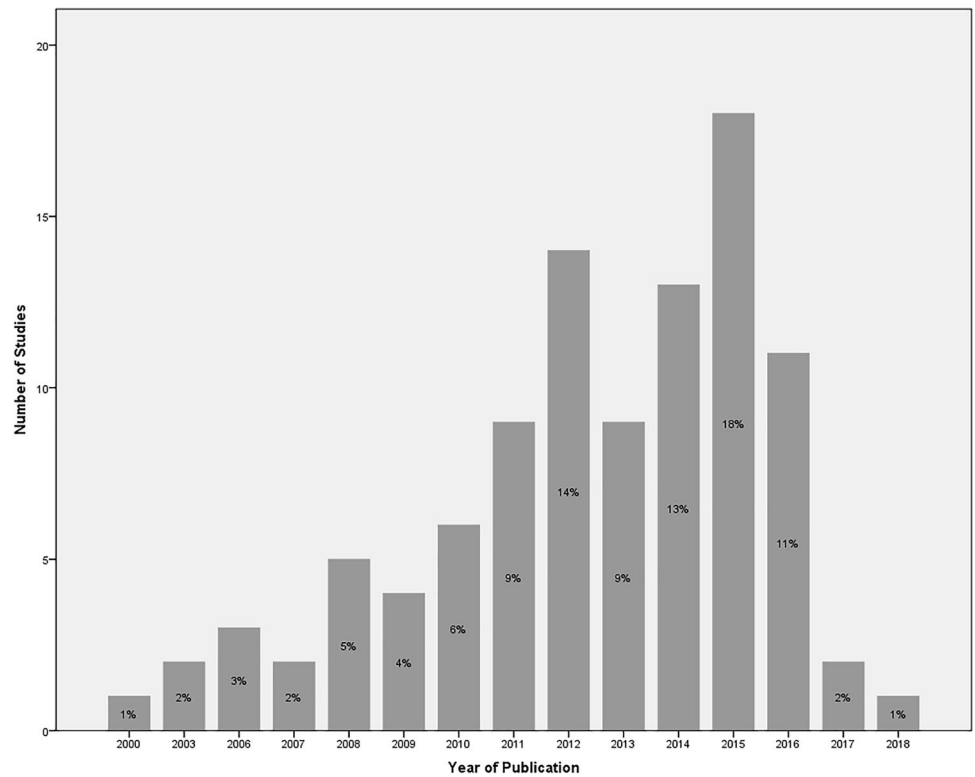


Fig. 2 Time-pattern distribution of the 100 most-cited systematic reviews on oral and maxillofacial surgery



in journals with high impact factors which also is considered as an indication of high quality papers [25, 26]. Thus, the frame used in this study only including the five

top journals in the specific field of OMFS with impact factor above 1.0 can still be a good indicator for the current trends in the field of OMFS and a useful guide for

Fig. 3 Topics covered among the 100 most-cited systematic reviews on oral and maxillofacial surgery

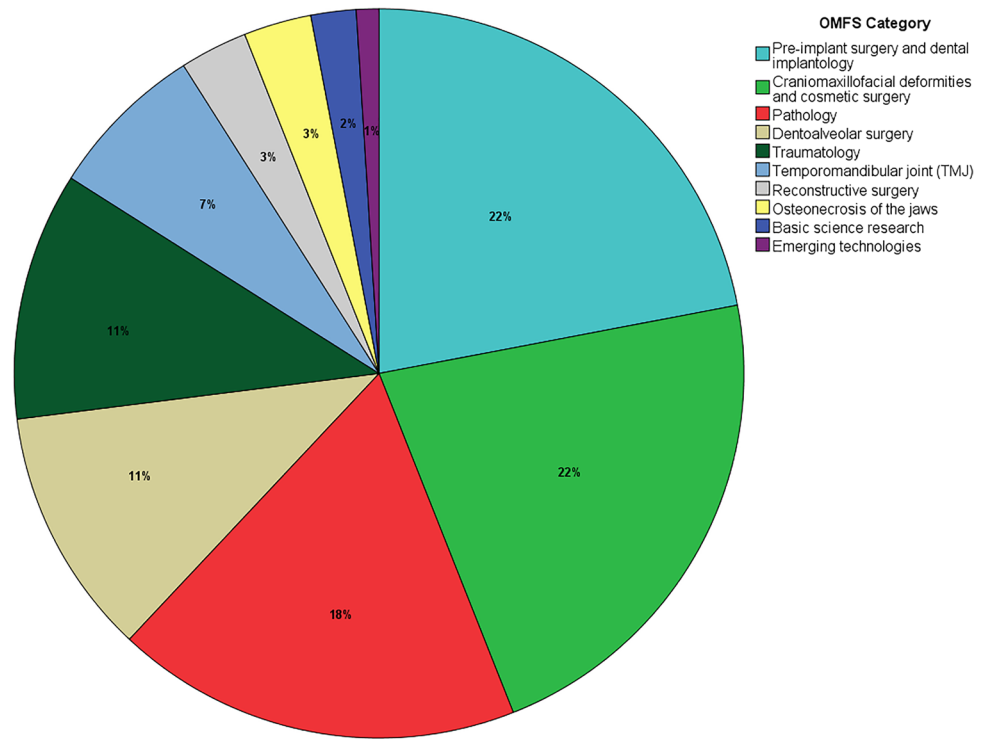
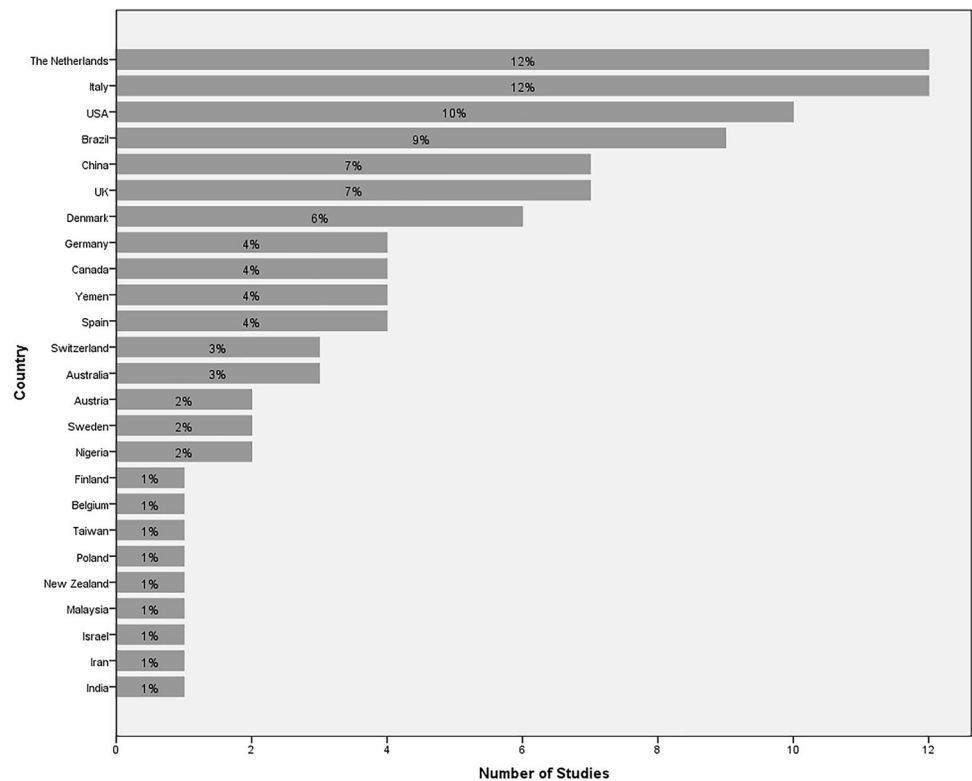


Fig. 4 Country of author's institute for 100 most-cited systematic reviews

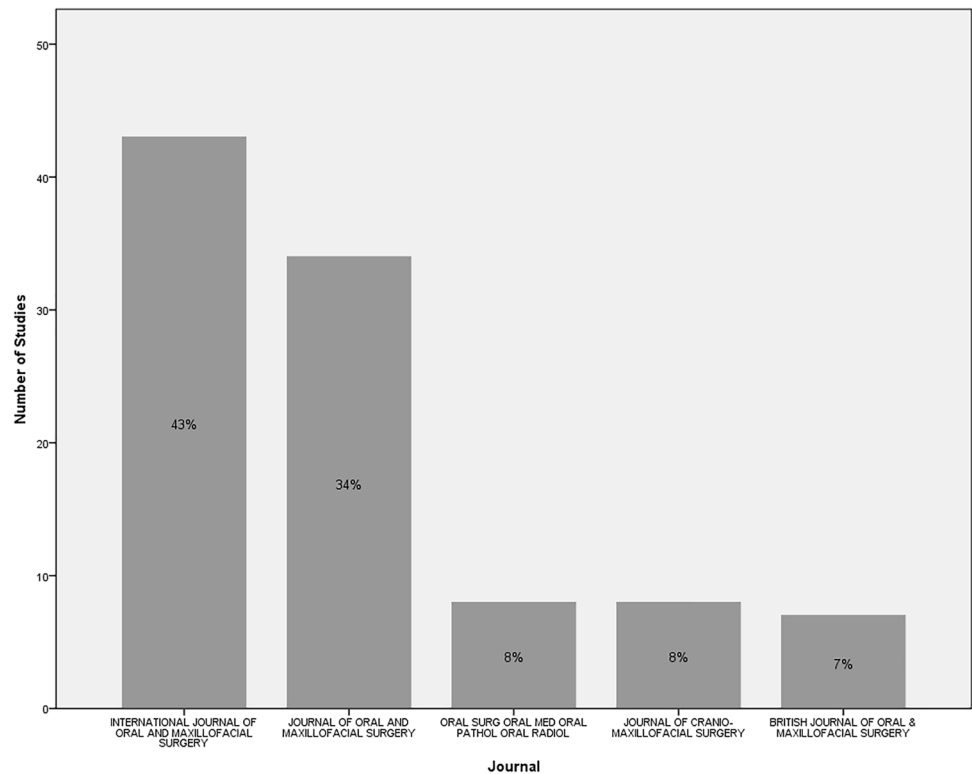


readers at any professional level with interest in this field.

In conclusion, in the field of OMFS for the years following the year of 2000, the majority of the top-cited

systematic reviews are published after the year of 2010 in nations with better economic rankings. Furthermore, the most-cited systematic reviews were on dental implant

Fig. 5 Most frequently cited journal



surgery, which might not be so surprising since it is the vast most common surgical procedure next to tooth extractions.

Abbreviations OMFS: Oral and maxillofacial surgery; TMJ: Temporomandibular joint; IJOMS: International Journal of Oral and Maxillofacial Surgery; JOMS: Journal of Oral and Maxillofacial Surgery; JCMS: Journal of Cranio-maxillofacial Surgery; BJOMS: British Journal of Oral & Maxillofacial Surgery; TRIPLE O: Oral Surgery Oral medicine Oral pathology Oral radiology

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Declarations

Competing interests The authors declare that they have no competing interests.

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