

Bibliometric Analysis of 50 Most Cited Articles on Odontomas

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Abstract

Objective: To identify the citation features and review articles on odontomas using bibliometric analysis.

Material and Methods: A list of studies about odontoma was obtained by searching using the Scopus database. Abstracts or full texts were read and evaluated. After then, 50 most cited articles were achieved. Studies were categorized as citation numbers, citation density, journal name, article type, the affiliation of the first author and publication year. Descriptive statistics were used to analyze the results. **Results:** The most frequently cited article received 358 citations, while the least frequently cited article received 42 with a mean of 94.3 citations per article. The mean citation density was 5.13. The study with the highest citation density (12.31) was published in 2006. The highest citation number was found in the 2000s following the 1990s. The 50 most cited articles were published from 1971 to 2011, with 84% (42 of 50) published after 1990. USA (n = 9) and Brazil (n = 6) were the two most contributing countries. According to article type, there were eight (16%) review articles. **Conclusion:** The USA found to have a strong influence on research about odontoma, followed by Brazil. All researches were reported in English, and most of them were published in good quality journals.

Keywords: Information Science; Bibliometrics; Dentistry; Publications.

Introduction

Odontoma is a developmental anomaly arising from the completely differentiated epithelial and mesenchymal cells growth that cause ameloblasts and odontoblasts. It is composed of enamel and dentin but may also have various amounts of cement and pulp [1]. During the development of odontoma, enamel and dentin may be deposited and structure resembles a normal tooth. At that time, the tumor is termed as compound odontoma. If dental tissues form an irregular mass, it is termed as a complex odontoma [2].

In the field of evidence-based medicine, decisions in clinical medicine should be based on sufficient research and analysis of the literature [3]. Currently, there are excessive published articles, so researchers don't always evaluate the publication quality for easily accessing the source. They also might have difficulties to identify the major research fields. A bibliometric analysis allows scientists to describe important research points and to find the current information in a particular area [4].

In scientific technology, the indicators have an important role in determining the way of activities in a region or country. New techniques to collect and analyze data develop, and can be used as a basis of reliable data. Related to the scientific journals, the bibliometric indicators are useful to evaluate the journal's internal situation, its relative position regarding the debate for article publication, and the basis for strategic editorial policies [5].

Bibliometric analysis of odontoma was not found in the literature. This has been our source of enthusiasm when planning this study. The aim of this study was to identify and review 50 most cited articles on odontoma using bibliometric analysis.

Material and Methods

In August 2019, a title search was started in the Scopus library database (www.scopus.com) using the Medical Subject Heading (MeSH) terms "odontoma". There were no limitations except document type. Research articles and reviews were included in this study. The choice "Cited by (Highest)" was applied to have the detailed list of most-to-least cited articles for further analysis. In the light of this strategy, a list of the 50 most cited odontoma articles was prepared.

According to the previously reported method [6], two independent authors (GS) and (MS) reviewed all the selected articles and noted these information: journal name and impact factor (2018 Journal of Citation Reports - JCR: Science Edition), Scopus citation number and density (mean number of citations per year = total number of citations/years since publication of the article), publication year, article title and country of the first author. Articles were classified as primary research studies (basic, clinical, or epidemiological) or secondary research (narrative review, systematic review, or meta-analysis) [7]. Any disagreement between the two authors about the data extraction was resolved by consensus.

Data Analysis

Descriptive statistics were used to calculate the absolute and relative frequencies and mean.

Results

Citation Numbers and Density

In the literature, search articles were found in the Scopus database library from 1893 to the present. The details of the 50 most cited publications [8-57] are shown in Table 1.

Table 1. List of the 50 most cited articles on odontoma.

No	First Author	Year	Type	IF 2018 JCR	Scopus Citation	Citation Density
1	Regezi et al. [8]	1978	Article	1.781	358	8.73
2	Daley et al. [9]	1994	Article	1.69	257	10.28
3	Miller and Rubinstein [10]	1995	Article	2.197	210	8.75
4	Philipsen et al. [11]	1997	Article	3.730	192	8.72
5	Mosqueda-Taylor et al. [12]	1997	Article	1.69	168	7.64
6	Slootweg [13]	1981	Article	1.69	161	4.23
7	Buchner et al. [14]	2006	Article	1.781	160	12.31
8	Lu et al. [15]	1998	Article	1.69	158	7.52
9	Jing et al. [16]	2007	Article	1.961	145	12.1
10	Philipsen and Reichart [17]	2000	Review	3.730	137	7.21
11	Ladeinde et al. [18]	2005	Article	1.69	133	9.5
12	Hong et al. [19]	1991	Review	1.69	130	4.64
13	Buchner [20]	1991	Article	1.781	129	4.61
14	Ochsenius et al. [21]	2002	Article	2.03	110	6.47
15	Sato et al. [22]	1997	Review	1.164	108	4.91
16	Luo and Li [23]	2009	Article	3.730	105	10.5
17	Ledesma-Montes et al. [24]	2008	Article	2.03	95	8.64
18	Adebayo et al. [25]	2005	Review	1.781	94	6.71
19	Fernandes et al. [26]	2005	Article	2.03	90	6.43
20	Li and Yu [27]	2003	Article	6.155	81	5.06
21	Kim and Ellis [28]	1993	Article	1.781	80	3.07
22	Howell and Burkes [29]	1977	Article	1.69	74	1.76
23	Budnick [30]	1976	Article	1.69	74	1.72
24	Dunfee et al. [31]	2006	Review	3.249	73	5.61
25	Kaugars et al. [32]	1989	Article	1.69	70	2.33
26	Tamme et al. [33]	2004	Article	1.942	69	4.6
27	Takeda [34]	1999	Review	3.730	69	3.45
28	Olgac et al. [35]	2006	Article	1.164	64	4.92
29	Vered et al. [36]	2005	Article	3.730	63	4.5
30	Mosadomi [37]	1975	Article	1.69	62	1.41
31	Lima et al. [38]	2008	Article	1.709	61	5.54
32	Wijn et al. [39]	2007	Review	2.625	61	5.08
33	Sousa et al. [40]	2002	Article	0.731	61	3.59
34	Tanaka et al. [41]	1999	Article	1.69	57	2.85
35	Santos et al. [42]	2001	Article	1.223	56	3.11
36	Tawfik and Zyada [43]	2010	Article	1.69	54	6
37	Dhanuthai et al. [44]	2007	Article	2.057	53	4.42
38	Tomizawa et al. [45]	2005	Article	2.057	52	3.71
39	Eversole et al. [46]	1971	Article	1.69	52	1.08
40	Al-Khateeb et al. [47]	2003	Article	1.961	48	3
41	Chen et al. [48]	1998	Article	3.312	47	2.24
42	Osterne et al. [49]	2011	Article	1.69	46	5.75
43	Amado Cuesta et al. [50]	2003	Review	1.284	46	2.87
44	Hirshberg et al. [51]	1994	Article	1.781	45	1.8
45	Gardner [52]	1984	Article	1.69	45	1.28
46	Kaplan et al. [53]	2008	Article	1.69	43	3.91
47	Fregnani et al. [54]	2003	Article	2.03	43	2.68
48	Owens et al. [55]	1997	Article	0.731	43	1.95
49	Serra-Serra et al. [56]	2009	Article	1.284	42	4.2
50	Chen et al. [57]	2005	Article	2.03	42	3

The number of citations of 50 most cited articles was between 42 and 358, with a mean of 94.3 citations per article. The most cited article with 358 citations belonged to Regezi et al. [8], published in 1978. This article was followed by the articles reported by Daley et al. [9] with 257 citations and Miller and Rubenstein [10] with 210 citations. These three most cited articles were research articles.

The mean citation density was 5.13. The study of Buchner et al. [14] had the highest citation density (citation density: 12.31) and was published in 2006. The lower citation density was calculated in the study of Eversole et al. [46] (citation density: 1.08), which was published in 1971. The highest citation number was found in the 2000s following the 1990s (Figure 1).

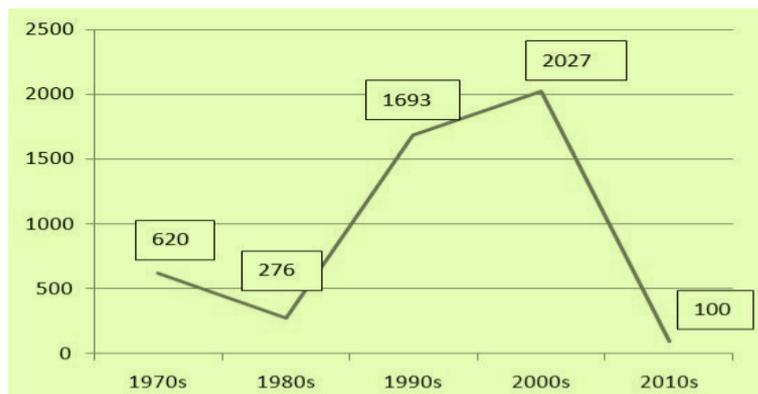


Figure 1. Distribution of the 50 top-cited articles on odontoma by citation number.

The Feature of the Journals, Authors, and Publications

The 50 most cited articles were published in 19 journals (Table 2). The journal with the highest contributions was *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology* (16 articles). Of 19, eight (42.1%) journals contributed a single article each in the most 50 cited articles list.

Table 2. List of the most cited journals.

Journal Name
Journal of Oral and Maxillofacial Surgery
Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology
American Journal of Medical Genetics
Oral Oncology
British Journal of Oral and Maxillofacial Surgery
American Journal of Surgical Pathology
Radiographics
Journal of Cranio-Maxillofacial Surgery
British Journal of Oral and Maxillofacial Surgery
Journal of Applied Oral Science
Oral Diseases
Pesquisa Odontológica Brasileira
International Journal of Paediatric Dentistry
International Journal of Oral and Maxillofacial Surgery
Pediatric Dentistry
Medicina Oral
Journal of Clinical Pediatric Dentistry
Medicina Oral, Patología Oral y Cirugía Bucal
Journal of Oral Pathology and Medicine

The impact factor of the journals was between 1.164 and 6.155 (mean = 2.09). The journal, which had the highest impact factor, was the *American Journal of Surgical Pathology*. One journal (5.26%) of all selected journals had the five or more impact factor.

All 50 most cited articles were published in English between the years of 1971 and 2011, with 84% (42 of 50) published after 1990. The oldest article was published by Eversole et al. [46] in *Oral Surgery, Oral Medicine, Oral Pathology*. The most recent article was reported by Osterne et al. [49] in *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontology* in 2011.

The majority of the publications were primary research (n = 42), whereas 8 (16%) were review articles (secondary research). Epidemiological studies were found as the most designed study. Eight articles were found as narrative reviews. According to the address of the first author, authors from 18 different countries had contributed to the 50 most cited articles list. The USA had the highest number of publications (9 articles). Brazil (6 articles) was the second most productive countries following China (5 articles) (Figure 2). An institution with the highest representations in the 50 most cited articles was Tel Aviv University (Israel) following Peking University (China) (Table 3). The article number was highest in the 2000s (Figure 3).

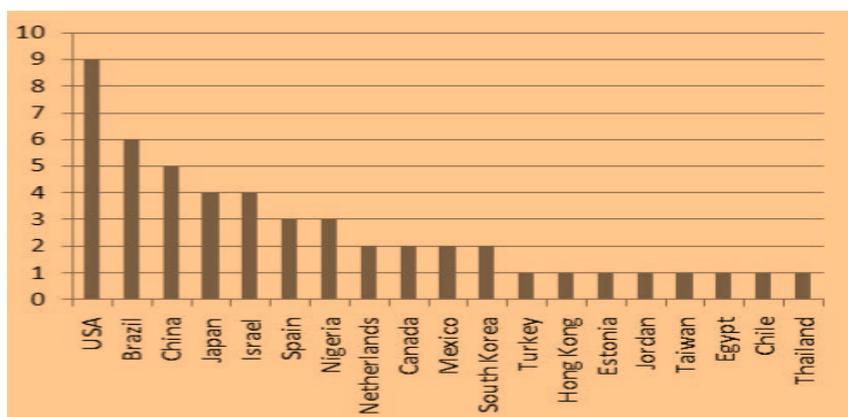


Figure 2. Country of origin of the first author.

Table 3. Institutions with the highest representations in the 50 most cited articles.

No	Institution	Country	No. of Articles
1	Tel Aviv University	Israel	4
2	Peking University	China	3
3	University of Lagos	Nigeria	2
4	Universitat de Barcelona	Spain	2
5	Seoul National University	South Korea	2

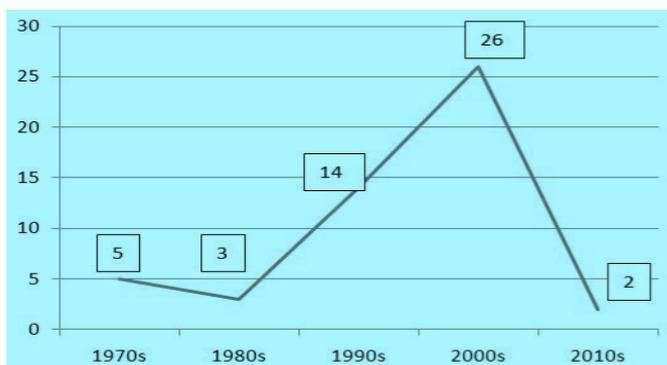


Figure 3. Distribution of the 50 top-cited articles on odontoma by publication date

Discussion

The bibliometric analysis helps to describe the historical evaluation of researches in the relevant area and changes over the years. Both impact factor of the journal and citation number of an article are the main criteria to describe the academic/scientific influence [58]. To know the highly cited articles may provide additional cognizance into a better understanding of the related area and help the education [59-61]. To the best of our knowledge, this is the first bibliographic study on odontomas in the literature.

Although the citation index is not accepted as a quality criteria, it is accepted as an identifiability measurement [62]. So, we preferred to evaluate the journals in the Science Citation Index and Science Citation Index Expanded in this study. Journals with high impact factor are attracted by authors for deciding the journal that is submitted their manuscript [58]. Although the positive relationship is observed between the citations index and impact factor of the journals in the previous studies [63,64], in this study, there was only one article published in the journals with an impact factor of more than five. This journal was the *American Journal of Surgical Pathology*.

This bibliographic analysis showed the features of 50 most cited articles on odontomas. All articles, which were analyzed in this study, were written in English. In the present study, the most recent article was published in 2011. This indicates that no articles have been included in the 50 most cited articles since 2011. This can be attributed to the fact that older articles have more time to receive citations.

In bibliometric studies, geographic predispositions of a pathology certainly have an effect on article numbers published by the country [65]. The geographic distribution of odontogenic tumors is changeable, fundamentally due to the high genetic and cultural diversity [66]. The etiology is uncertain and the greater part of them develops without an observable cause [67]. In this study, the USA had the highest number of publications and Brazil was the second most productive country. We thought that this might be due to the high number of patients presenting and genetic factors. Additionally, there are similar results in previous bibliometric analyses showing a higher contribution of the USA in articles [64,68,69]. The USA has a strong effect on health sciences, a higher number of researchers, and higher financial support for the researchers [70].

Except for the Scopus database, other databases such as Web of Science, Google Scholar supplies the bibliometric information about the published articles. There are alterations in the citation numbers to any specific article as allocated by Web of Science, Google Scholar, and Scopus. Generally, Google Scholar and Scopus assign higher citation numbers than Web of Science [71]. Scopus also provides approximately 20% more coverage than Web of Science, whereas Google Scholar provides results of inconsistent certainty [72]. Although the Web of Science is well known and accepted database by the scientific community but does not always involve citations from textbooks and journals published in another language apart from English [73]. So we preferred using the Scopus database in this study for these advantages. However, there are some limitations to this study. As well as the Scopus advantages, other indexes such as Web of Science and Google Scholar can not be evaluated.

Conclusion

The present study will be the first bibliographic study on odontoma in the literature. The USA found to have a strong influence on research about odontoma, followed by Brazil. All researches were reported in English, and most of them were published in good quality journals. However, this bibliometric analysis allows the journals to determine their current management strategy. So, we believe that this study will shed light on the literature, and it will be useful.

Authors' Contributions

GS	 0000-0001-7439-3554	Conceptualization, Methodology, Investigation, Formal Analysis, Writing-Original Draft Preparation and Writing – Review and Editing.
MS	 0000-0003-1166-2467	Investigation, Formal Analysis, Writing – Original Draft Preparation and Writing – Review and Editing.

All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

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None.

Conflict of Interest

The authors declare no conflicts of interest.

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