

## Citations

**Background.**—It is speculated that the number of citations an article receives may indicate the potential of the article to change clinical practice, alter discussions, generate controversy, or provoke further research. Considerable debate continues regarding the value of citation with respect to quality of research or relevance of the authors. Temporal bias is possible because citations tend to accumulate over time, but as the article's content is absorbed into the culture, citation rates may also fall. Recent articles may not have time to generate high rates of citation. However, citation analysis indicates that in specific areas of knowledge, citation correlates well with other indicators of scientific recognition. The most relevant bibliometric information from published scientific articles has been compiled by the Institute for Scientific Information (ISI) since 1945 into the Science Citation Index Expanded, which is a section of the Web of Science. This platform has been used to identify the most widely cited articles in the medical sciences. Some dental specialties have undertaken a citation analysis in the field of dentistry. These bibliometric resources were used to identify the 100 most cited articles in dental journals and to assess their defining characteristics.

**Methods.**—All of the journals in the ISI Web of Science category “Dentistry, Oral Surgery, and Medicine” were analyzed using the Cited Reference Search tool of that database to select the most cited references up to June 2012. For each article, the names and number of authors, journal, year of publication, type of study, methodological design, and area of research were noted.

**Results.**—Number of citations was between 326 and 2050, with each of the first “most cited” articles having over 1000 citations each and all of the first 35 having more than 500 citations each. An article published in 1993 by Henning Birkedal-Hansen et al in *Critical Reviews in Oral Biology and Medicine* was the most cited paper, with 2050 citations. The paper was a review of the extracellular matrix metalloproteinases and their role in the development of certain pathological conditions. The second most cited article, with 1765 citations, was published in 1981 by Ragnar Adell et al in the *International Journal of Oral Surgery* and concerned the rehabilitation of the edentulous jaw using osseointegrated implants. Harald Loë et al published the third most cited article in 1965 in the *Journal of Periodontology*. Its topic was experimental gingivitis in man. Twenty-five articles were the work of a single author, 18 had two authors, and 12 had more than six authors. Sigmund S Socransky was the author of 9 articles,

which was the most by a single author, with Jan Linde having 7, and Harald Loë, Jørgen Slots, and Anne D Haffajee having 6 articles each.

Considering the decades of publication, most articles of the 100 were published between 1980 and 1989 (26 articles), followed by 1990-1999 (25 articles), and 1970-1979 (22 articles). Clinical research topics were covered by 66 of the articles, with basic research covered in 34 (Table 3). Study design in 22 articles involved case series, whereas 19 articles were narrative reviews and/or expert opinion. Periodontology was the area of concern in 43 articles, then implantology (11 articles) and adhesive restorations (8 articles). The journal with the largest number of articles cited was the *Journal of Clinical Periodontology* (20 articles), then the *Journal of*

**Table 3.**—Type of Study, Methodological Design, and Specific Field of the 100 Most Cited Articles in Dentistry

Type of study	Clinical=66 % Basic=34 %
Methodological design (evidence level (EL))	Animal studies=9 % (EL 5) Case report=1 % (EL 5) Classifications or tools for evaluating results=13 % (EL 5) In vitro studies=7 % (EL 5) Narrative review/expert opinion=19 % (EL 5) New material or technique=5 % (EL 5) Case-control studies=11 % (EL 4) Case series=23 % (EL 4) Cohort studies=8 % (EL 3) Randomized clinical trials=2 % (EL 2) Systematic review/meta-analysis=2 % (EL 1)
Area of research	Periodontology=43 % Implantology=11 % Adhesive restorations=8 % Bone morphology/histology=7 % Endodontics=6 % Caries=5 % Oral medicine/pathology=5 % Orthodontics=4 % Saliva/Biochemistry=4 % Pain-dysfunction/orofacial pain syndrome=3 % Oral hygiene=2 % Pediatric dentistry=1 % Behavior management=1 %

(Courtesy of Feijoo JF, Limeres J, Fernández-Varela M, et al: The 100 most cited articles in dentistry. *Clin Oral Invest* 18:699-706, 2014.)

*Periodontology* (18 articles), followed by the *Journal of Dental Research* (16 articles).

**Discussion.**—Among the most cited articles, the majority were clinical studies, especially case series and narrative reviews and/or expert opinions. The fields of periodontology and implantology were most often the topic of these studies. Most of the articles were published in dental journals considered to have a high impact factor.

**Clinical Significance.**—Although there are limitations in this review, it points out important information about some of the assumptions regarding what constitutes a “classic reference” in the field of dentistry. Traditionally, any reference cited at least 100 times is considered classic and usually represents an historical reference point in the development of an area. The least number of times a reference on this list was cited was 326, so many articles that would be considered classic are missing. The fact that some articles with a high number of citations may have been excluded because the journal is no longer included in the category searched may also affect the outcome. In addition, there is no way to eliminate self-citations or to identify if a “snowball effect” of citing references because they have received numerous citations in the past is at work. It has also been assumed that the true impact of a study cannot be assessed sufficiently until at least 20 years after

publication. This might explain the high number of articles that came from the decades of the 1980s and 1990s. Older articles are usually cited more frequently, with more recent articles frequently undervalued. In this review, only nine articles since 2000 are included. The emphasis on clinical content is also seen in other disciplines such as general surgery, anesthesia, and orthopedic surgery. Disappointingly, most articles presented evidence at the levels of 4 and 5, and the list included only two randomized clinical trials and two systematic reviews/meta-analyses. Thus the level of evidence does not necessarily correlate with the number of citations—as has been noted in other medical fields. Many articles came from journals that have a high impact factor ranking. The impact factor of a journal is not determined just by the number of citations of the most relevant articles, but by the total number of citations in a given year by all of the articles published in the previous 2 years. Other factors may include an increase in the relevance of some journals or a decrease in the relevance of others.

Feijoo JF, Limeres J, Fernández-Varela M, et al: The 100 most cited articles in dentistry. *Clin Oral Invest* 18:699-706, 2014

Reprints available from P Diz, School of Medicine and Dentistry, Special Needs Unit, c/Entrerriós sn, 15782 Santiago de Compostela A Coruña, Spain; e-mail: [pedro.diz@usc.es](mailto:pedro.diz@usc.es)

## Dental Trauma

### Maxillofacial trauma trends

**Background.**—Various factors appear to influence the incidence and etiology of maxillofacial fractures. Among these are geographic area, whether the population is urban or rural, population density, and socioeconomic status. Motor vehicle collisions (MVCs) are a significant cause of these fractures, along with assaults, sports injuries, occupational pursuits, domestic violence, and falls. Soft tissue injuries, neurologic trauma, and orthopedic injuries often accompany and are correlated significantly with maxillofacial fractures. Some concomitant injuries can be life-threatening, including cerebral trauma, hemorrhagic shock, hemopneumothorax, and airway compromise. More than 6% of patients who suffer maxillofacial fractures

require a life-saving emergency intervention. The incidence and etiology of maxillofacial fractures seen in a single trauma center were evaluated over the period between 1984 and 1990 (1990 study) and the period between 2004 and 2010 (2010 study) to determine if differences exist.

**Methods.**—The records of patients with maxillofacial fractures were retrospectively studied over the two time periods at the authors' institution. Number of fractures, mechanism of injury, patient age, and mortality were compared.

**Results.**—In the 1990 study, 152 midface and 306 mandibular fractures occurred, for a total of 458