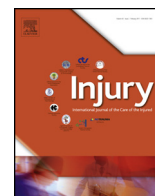




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Review

# The top 100 cited of *injury*-international journal of the care of the injured: A bibliometric analysis

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ABSTRACT

**Background:** With nearly 50 years' of development, *Injury* has become one of the leading journals in its specialty. The aim of this article is to identify, analyze the characteristics of the 100 most cited articles published by the journal to date.

**Method:** We searched the Thomson Reuters Web of Science Core Collection for citations of all articles published in *Injury* since its launch. For the Top 100 most frequently cited articles, title, author name, number of authors, publishing date, citation number, country of origin, institution, pages, number of reference, type of article, study topic, study design, funding source, and level of evidence of each clinical article were recorded and analyzed.

**Results:** Only 50 self-citations were found in 12436 total citations of the top100 articles, fifty-four articles exceeded 100 citations. Total citations of the Top 100 articles ranged from 77 to 599. The Top 100 articles were published between 1973 and 2012, the mean authorship and institution number per paper was 3.92 and 1.84 respectively. The mean page number was 8.26 and the mean reference number was 45.2. England, Germany and Switzerland ranked the top three countries of origin. Among the T100 articles, there were 50 clinical studies, 5 basic researches, and 45 reviews. The most common study type was case series, and most common topics were bone reconstruction, trauma and bone fracture. The most common level of evidence was level IV.

**Conclusions:** This study may help researchers to find out the important information on the classic articles and provides useful insights for the authors who want to publish their research in *Injury*.

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**Introduction**

*Injury* has published 9599 articles since its foundation in 1969. With nearly 50 years' of development, focusing on all aspects of trauma care and accident surgery, the journal has become one of the leading journals in its specialty. It is not only the official journal of British Trauma Society, the Australasian Trauma Society, and the Saudi Orthopaedic Association in Trauma, but also affiliated with 12 international trauma societies. As the editors said, the aim of this journal is to facilitate the exchange of ideas, techniques and information among members of the trauma team all around the world.

Citation analysis is a method to determine the influence of an article in the scientific community and evaluates the impact factor (IF) of a journal [1]. A paper with greater citation history may be more valuable in its field [2]. *Injury* had an impact factor of 1.910 in 2015 (John Wiley & Sons, Inc., 2016) according to the Thomson Reuters Journal Citation Reports, which measures the frequency with which the 'average article' in a journal has been cited in a particular year or period (Thomson Reuters, 1994). *Injury* is ranked 8th out of 24 in Emergency medicine, 25th out of 74 in Orthopedics, and 24th out of 33 Critical care medicine based on its impact factor among SCI-listed journals.

The purpose of this study was to identify, analyze, and categorize the most frequently cited articles published by *Injury* since its launch.

**Methods**

*Research strategy and data collection*

We conducted the current citation analysis of all papers published in *Injury* since its foundation by using the Thomson Reuters Web of Science Core Collection (Philadelphia, Pennsylvania, USA) on 2nd May 2017. The results were sorted by using the option 'Times cited', which yielded a list of all the articles published in a journal ranked by citation number. The top 100 papers were identified, each article on the list was reviewed by two independent reviewers, via reading the abstracts acquired from Web of Science. The full texts were retrieved when it was necessary. We included all kinds of publications including original articles, review articles, and other reports.

Two independent authors reviewed the top 100 cited articles and the following data were extracted and analyzed: title, author name, number of authors, publishing date, citation number, country of origin, institution, pages, number of reference, type of article, study topic, study design, funding source, and level of evidence of each clinical article. The type of article was determined into different categories: clinical research, basic research, and review. Study designs were included randomised control trials (RCTs), prospective and retrospective observational cohort study, case control, case series and expert opinion. We also calculated the citation index that defined as citation number per year for each article. If there were authors from different countries or institution in one article, the original country or institution of the article was determined by using the country or institution the corresponding author belonged to. The level of evidence for clinical studies was evaluated based on the guidelines published by The Journal of Bone & Joint Surgery-American Volume [3]. Any different opinion in data collection was resolved by discussing with a third author.

*Statistical analysis*

The Spearman test was used to evaluate the strength and direction of the linear relationship between different variables (number of authors, number of institution, pages, number of reference, citation number and citation index) and publishing year of the top100 cited articles. Citation numbers in different Levels of evidence and types of articles were analyzed by ANOVA test. All data analyses were performed with SPSS 22.0 software (SPSS, Chicago, Illinois, USA). All probability values were two-tailed, and the threshold for significance was set at  $p < 0.05$ .

**Results**

Table 1 listed the top 100 articles, number of citations and citation index per article. Only 50 self-citations were found in 12436 total citations of the top100 articles, accounting for 0.4% of overall citations. Fifty-four articles exceeded 100 citations. The number of citations per article ranged from 77 to 599 times, and the mean citation number was 140.5 times. The mean citation index was 39.3 times, ranged from 1.89 to 43 times. The highest ranking article both in citation numbers and citation index was the one written by Giannoudis with 599 total citations and 43 citations per year [4]. The oldest article was written by Ruedi. Th, and published in 1973 [5], the most recently one was written by Kehoe. S and published in 2012 [6].

The top 100 articles were published between 1973 and 2012, with most articles published in the 2000 s group with 62 articles, followed by the 1990s with 18 articles and only 3 articles published in 1970s (Fig. 1). The most cited articles published in a single year were 2007 and 2008 with 12 articles each. The highest citation number was also found in the 2000s (8471 citations), while the 1970s contributed the lowest citation number (422 citations) (Fig. 2). No correlation was found between publishing year and number of citations ( $r = 0.166$ ,  $p = 0.099$ ). However, there was a positive correlation between publishing year and citation index ( $r = 0.841$ ,  $p < 0.001$ ). The mean number of pages and the mean references of Top 100 articles was 8.26 (3–42 pages) and 45.2 (4–213 references). Publishing year had a positive linear relationship with not only page number ( $r = 0.247$   $p = 0.013$ ); but also reference number( $r = 0.610$   $p < 0.001$ ).

A total of 325 authors were found in the top 100 articles. Seven were written by a single author and 18 were written by two co-authors. Mean authorship number was 3.93 per article, ranged from 1 to 25. Eight authors were represented three times in the top 100 list (Table 2). We found a positive trend between publishing year and the number of authors ( $r = 0.235$ ,  $p = 0.019$ ).

The top100 articles originated from 23 countries, with England ( $n = 35$ ), Germany ( $n = 17$ ), Switzerland ( $n = 13$ ), and the USA ( $n = 12$ ) holding the top four positions. Other countries with the top 100 publications were showed in Fig. 3. A total of 130 institutions were found in the top 100 articles. Then mean number of institutions per article was 1.84, ranged from 1 to 6. The top three corresponding institutions with the most productive articles in the top 100 articles were all from England, James's University Hospital with 8 publications, Leeds Teaching Hospitals with 6 publications, and Royal Infirmary of Edinburgh with 5 publications (Table 3). There was a significant correlation between publishing year and number of institutions ( $r = 0.417$   $p < 0.001$ ).

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