

PERSPECTIVES

# Ranking of orthopaedic journals: A challenge to the citation-based metrics



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## KEYWORDS

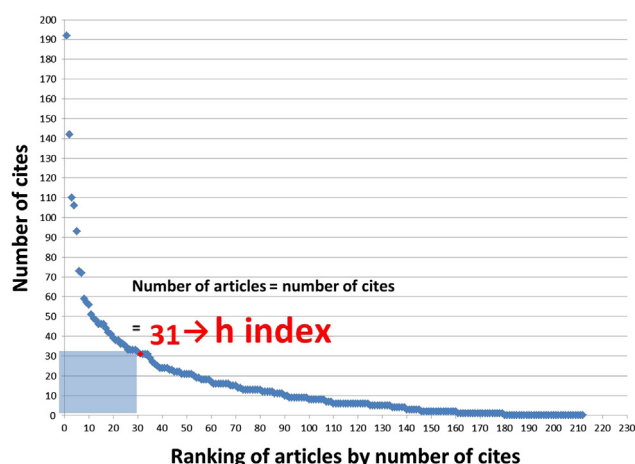
Citation metrics;  
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**Summary** Citation-based metrics for journal ranking may provide objective measures to quantitate a journal's contribution to scientific progress as reflected by citation, but comparison of journals solely based on citation-metrics is unjustified. There are two major types of citation-based metrics: the count of cites per paper and the count of papers with significant citations, as exemplified by the *h*-index. Orthopaedic journals are more likely to be underrated by most citation-based metrics, and this is accounted for by the lower citation potentials. Ranking of orthopaedic journals based on different citation metrics demonstrated a reasonably suitable accordance, but numerous orthopaedic journals experienced greater discrepancies in the measures of the journal's popularity and prestige. Citation-based ranking should not be equated with the scholarly performance of a journal; other criteria to evaluate the "impacts" of journals should be explored as well, such as clinical impacts rated by clinicians. Journal rankings and citation metrics are often used by universities, hospitals, research institutions, and granting agencies for performance assessment and resource allocation. The clinical impact and, to a certain extent, the emphasis on the quality of patient care, are not given the deserved recognition and are not priority considerations. This article sets the tone for a comprehensive review of the journal ranking system in orthopaedics.

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**Figure 1** A graph plotting the number of cites against ranking of articles published by a researcher. The *h*-index is read at the point where the number of top-ranked articles equals the number of cites. (Data shown are based on the publications of the corresponding author, K.M. Chan.)

Journal ranking is primarily devised for the purpose of evaluating the quality or impact of journals in specific fields. The most common ranking systems for orthopaedic journals are those based on citation metrics, such as the journal impact factor (JIF) [from Science Citation Index (SCI) by Thompson Reuters] or the SCImago Journal Rank (SJR) indicator (by Elsevier). These citation-based metrics are often misinterpreted as the quality of the journal or the research performance of researchers who publish papers in those journals. A recent movement, the San Francisco Declaration of Research Assessment [1], has spoken about the misuse of these journal-based metrics to evaluate research performance for promotion and resource allocation.

## Citation-based ranking

Researchers are incentivized to publish their works in journals with higher impact factors and/or higher rankings within field-specific categories, in order to gain more resources from their institutions or funding bodies. This “rule of game” of publishing in high impact factor journals is especially unfavourable for researchers in specific clinical subspecialties such as orthopaedics. Orthopaedic journals get lower journal impact factors (JIFs); however, this may only reflect the differences in citation preference rather than the quality of the research works published in orthopaedic journals.

Moreover, journal ranking based solely on its impact factor may not truly reflect the impact of the journal with respect to influences and readership. In view of translational medicine, the impact of research papers may be reflected in the inspiration for the development of new products, implementation of new clinical practices, or new treatment approaches. These impacts are not counted by most citation-based metrics, nor are they formally recorded. It follows that researchers who have published papers with a real clinical impact, but low citation value, may not get sufficient recognition and hence their research performances are underrated.

There is no doubt that research performance can be evaluated by the quantity and more importantly, the quality of publication. However, it remains controversial as to how to evaluate the quality or impact of a research paper and citation-based metrics cannot be the sole criteria. It is time to reinvestigate the current systems for evaluating the impacts of research papers and hence journal ranking. In this article, we will review the current journal ranking systems and analyse the current scenario of journal ranking in the orthopaedic arena.

**Table 1** Basic characteristics of some common citation-based metrics for journal ranking.

|                         | Database       | Time frame of citation | Cited side normalization | Citing-side normalization          | Controlled for co-authorship | Controlled for self-citation | Size-dependent | Allows cross-field comparison |
|-------------------------|----------------|------------------------|--------------------------|------------------------------------|------------------------------|------------------------------|----------------|-------------------------------|
| Journal impact factor   | SCI            | 2 y                    | None                     | Normalized with journal size       | No                           | No                           | No             | No                            |
| Eigenfactor score       | SCI            | 5 y                    | Weighted                 | None                               | No                           | Not allowed                  | Yes            | No                            |
| Article influence score | SCI            | 5 y                    | Weighted                 | Normalized with journal size       | No                           | Not allowed                  | No             | No                            |
| SJR                     | Scopus         | 3 y                    | Weighted                 | Normalized with journal size       | No                           | Controlled at a fixed level  | No             | No                            |
| SNIP                    | Scopus         | 3 y                    | None                     | Normalized with citation potential | No                           | Controlled at a fixed level  | No             | Yes                           |
| <i>h</i> -index         | No restriction | No restriction         | None                     | None                               | Yes                          | Possible                     | Yes            | No                            |

SCI = Science Citation Index; SJR = SCImago Journal Rank; SNIP = Source Normalized Impact per Paper.

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