EDITORIAL

BIBLIOMETRIC INDICATORS AND INTERNATIONAL PUBLISHING IN PHYSICAL AND REHABILITATION MEDICINE

In recent years there has been increasing interest in different models of bibliometric indicators in scientific publication. This also applies in the field of Physical and Rehabilitation Medicine (PRM). The best-known model is the Journal Impact Factor (JIF). However, some criticisms of the JIF have been put forward; by Lankhorst & Franchignoni in 2001 (1) and by Höök in 1999 (2). The JIF is calculated based on citations of publications over a 2-year period (known as the 2-year JIF) in publications published during the following year. It is used in determining the financing of research projects and for the assessment of publications of individual scientists for job promotion. Criticisms of the JIF include: that 2 years is too short a period, especially for clinical publications; that it for a journal may be dominated by rather few highly cited articles; and that it does not enable fair comparison between different scientific fields. In a recent Editorial in this journal (3) I advocated the use of the 5-year JIF, which covers a longer period of publication and may better reflect citation in clinical journals. This is supported by information on cited half-life.

In a Special Report published in the present issue of Journal of Rehabilitation Medicine (JRM) Franchignoni & Munoz Lasa (4) compared 7 different indicators for journals in the rehabilitation field. They advocated the use of the Eigenfactor Score (EFS), which they concluded would better reflect total citation impact and prestige. The EFS is based on publication during the last 5-year period, and is cited in a given year as the 5-year IF. It also takes into account in which journals the citations have appeared, such that citations in highly cited journals are weighted as providing a larger contribution than those in a lesser cited journals. It excludes citations of papers published in the journal itself. This final point may be questionable, especially in fairly small fields in which there are few journals to choose from. Also, from the reader's point of view, information from a research group with continuity of publication may be disregarded. An honest Editor does not impose on authors to cite papers that have been published previously in their own journal. The yearly number of articles published in the journal

has an influence on the EFS, and this must be borne in mind when evaluating the list of journals in the Special Report (which is shown in condensed form in Table I). However, EFS is an interesting approach that deserves further study.

Another measure, the Article Influence Score (AIS), is based primarily on the EFS, but a journal's AIS is divided by the number of articles published by the journal during the period in question and normalized as a fraction of all articles in all publications. Thus, the AIS is size-independent and, in fact, may be a more useful indicator.

Another new and interesting approach is the SCImago Journal Rank Indicator (SCI). In contrast to the JIF (which is based on the Thomson Reuter ISI Web of Knowledge), the SCI is based on the Scopus database, which includes a substantially larger number of journals than the Thomson Reuter ISI and also is published in a range of languages. The SCI expresses the number of weighed citations made in a specific year and published in the previous 3 years. Thus, it has a broader window than the 2-year JIF, but not as broad as the 5-year JIF, EFS and AIS. It is constructed to be size-independent, and thus would be considered of importance for evaluating the scientific value of a journal.

Some additional indicators have been studied and discussed, such as the h-index. I will not comment on these here, but note that their limitations are mentioned in the Special Report.

I have some general reflections on the aim of using a specific bibliometric indicator. Terms such as "popularity" (see also below on downloads) or "use" and "prestige" or, better, "influence" ought to be defined when used, and further analysed and discussed. When using an indicator it is important to determine whether the aim is to gain an understanding of the "average" use of that journal for citations, or of how important that journal is for creating citations, in which case the size of the journal should also be included. It must be kept in mind, therefore, that indicators do not relate to the scientific value of individual articles (which must be evaluated in other ways), and that the citation rate of individual articles within a journal may vary

Table I. *Bibliometric indicator values and rankings (in parentheses) of 5 journals selected by a European Consensus Committee on International Rehabilitation Journals (4). The values are those of 2009 JCR, except for SJR (2008). The journals are listed in alphabetic order (using official US National Library of Medicine (NLM) catalogue abbreviations)*

	Number of articles published 2009	EFS	AIS	JIF (JCR)	5Y-JIF	SJR
Am J Phys Med Rehabil	124	0.00728 (5)	0.560 (5)	1.556 (4)	2.014 (5)	0.117 (4)
Arch Phys Med Rehabil	271	0.02677 (1)	0.784 (2)	2.184 (1)	2.761 (2)	0.155 (1)
Clin Rehabil	107	0.00805 (3)	0.723 (3)	1.767 (3)	2.546 (3)	0.121 (3)
Disabil Rehabil	261	0.01078 (2)	0.564 (4)	1.555 (5)	2.056 (4)	0.099 (5)
J Rehabil Med	162	0.00778 (4)	0.849 (1)	1.882 (2)	3.027 (1)	0.129 (2)

JIF: Journal Impact Factor; EFS: Eigenfactor score; AIS: Article Influence score; SJR: SCImago Journal Rank; JIR: 2-year JCR Impact Factor; 5Y-JIF: 5-year JCR Impact Factor.

markedly. Another interesting factor may be to determine how often an article or a journal is downloaded from the Internet, indicating the general interest in, or "popularity" of, that article or journal. This often bears little relationship to the citation rate of that article or journal. Some journals have begun regularly to publish the number of downloads of the most downloaded articles, as a means of describing "popularity" in that sense (for example, for JRM see www.medicaljournals.se/jrm).

In summary, as is also concluded in the Special Report (4), it would be of value to use several indicators and to discuss further the different types of information that they present. In general, the widely-used 2-year JIF should not be the only measure used in the future. Further studies of bibliometric indicators are welcome, and in different research areas, to allow for generalization of the conclusions.

It is not justified to suggest that only the bibliometric indicators advocate for publishing in the 5 top journals selected by a European Consensus Committee on International Rehabilitation Journals (5), as the content and field of the journals are also important factors in choosing to publish in a specific journal. This is also emphasized in the Special Report (4). Some of the other journals listed in the Special Report are, however, not "true" PRM journals, at least not in the core area of rehabilitation as are the 5 specifically chosen journals, and therefore may not be the first choice for publication by PRM researchers. However, it is promising that those 5 journals were ranked highly in most comparisons. To allow for a simpler comparison between them, Table I shows most of the biometric indicators and the internal rank order of the journals. Based on the median values, Archives of Physical Medicine and Rehabilitation would rank first, closely followed by JRM, which is lower in EFS primarily due to its smaller size.

From an international point of view it is interesting that 3 of the journals have their Editorial offices in Europe and 2 in the USA. Looking at the Editorial Board members and Editors, the most internationally-oriented journals are Disability and Rehabilitation and JRM. However, it is likely that statistics about the distribution of the regional origin of the published papers would demonstrate an international representation for all 5 journals. At present no such statistics about the distribution of published papers in the journals are easily available for comparison, but they have been published recently for JRM (3). Our goal is to have a further increase in the contributions from different regions of the world.

In the present issue a short communication by Bakheit et al. with the title "Spasticity or reversible mucle hypertonia?" is published (p. 556–557). This aspect on terminology is interesting and it is planned to be followed by commentaries in forthcoming issues and we also welcome Letters to the Editor in reference to this.

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