sciendo

DOI: 10.2478/rjr-2022-0008

Romanian Journal of Rhinology, Volume 12, No. 46, April - June 2022

EDITORIAL

The Impact Factor in scientific journals

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The way to perform the metric in scientific journals and distinguish their quality is extremely biased to a small group of publishers with large economic income, limiting to lower classification scales in publishers from countries of scarce economic resources. This is due not to the low quality in their journals and research works, but more because of their low visibility and, with this, the decrease possibility of citation. In 1955, Eugene Garfield was the one who generated the universally accepted indicator as a bargaining chip to give value to scientific journals. Still today, it continues to represent an indicator of quality for many researchers and institutions; however, it is very important to reflect on it, due to the great advances in communication that have been generated and continue to happen.

We cannot deny the importance generated by the Journal Impact Factor (JIF) or the Impact Factor (IF). However, it is of great interest to consider other more balanced alternatives to measure the impact of a journal and its content. It is notorious the advance in science in all its dimensions. The field of health sciences has grown substantially and, thanks to the development of communication and dissemination of knowledge, there is better access to writings from different parts of the world almost immediately. This greater visibility was not available more than 60 years ago.

We must analyse if the measurement of the quality of an article or journal should continue to be based on IF. There are many authors who point out the disadvantages and limitations of this metric, and even propose another journal rating score as Eigenfactor, as a more updated and balanced metric.

Development

The Journal Impact Factor (JIF) has been the mainstay of the academic and scientific publishing community for 60 years. It is defined by the relationship between the received citations and the articles published by a journal and is intended to represent the value and prestige of an academic journal[1,2]. Initially, it was a useful metric in paper and library-based writing. The movement toward the digital and interdisciplinarity age has significantly changed the way we search for information and the growing desire for open and hybrid access. In time, knowledge distribution models have led to the depreciation of the JIF. However, Nestor et al. points out that conversely, academic editors have looked at the JIF to the point of obsession[3]. This concept represented the base on Eugene Garfield's idea to develop a citation index in 1955. He purposed to measure the influence of a journal, or the "Impact Factor", based on the number of citations received by its articles, in which it alludes that the articles that generate numerous citations are usually considered important or influential[4]. Therefore, journals with a large number of citations per article are often viewed with greater consideration in the eyes of the knowledge seeker community. Since its inception, the JIF has been used as a method to measure the credibility and importance of a journal. This metric tool had a great importance before the widespread use of the Internet, when libraries were somewhat forced to choose the journals on which to spend their limited budgets for their users. It is fair to sustain that the JIF has served its purpose in this regard, as it provides a general measure of citation rates and gives insight into the attention given to a journal. Typically, the highest quality journals in a specific field are scored with the highest JIF. However, for a long time, there have been many limitations and flaws relating to the JIF score. As technology advances and information search strategies have evolved, it appears that the JIF has become obsolete for the scientific community[3,5-10].

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Received for publication: November 8, 2021 / **Accepted:** December 15, 2021

As noted above, the impact factor represents the average number of citations received by an article that a scientific journal has published. Almost all citations are counted in the numerator, but the Institute of Scientific Information (ISI), which is the provider of the JIF, includes in the denominator only those items classified as "Article", "Review", or "Proceedings Document" by provider of the JIF[11,12]. Editorials, notes, letters, corrections, discussions and retractions seem to be excluded. The publication time period used to calculate the JIF score for each year is the previous two calendar years. Eugene Garfield founded the Institute of Scientific Information to provide scientometric database services, including calculating metrics and indexing journal citations. Over time, the database has expanded and now it includes more than 14,000 academic journals. ISI does not disclose with transparency or clarity the inclusion or exclusion criteria to grant this index, the process and rules of selection. There is evidence that high rates of self-citations can be a disqualifying factor, however it is a practice that continues to occur. The details of the calculation of the JIF itself are opaque. What elements are actually included in the numerator and the denominator remains a mystery. Various databases, including the ISI, have been used by journal publishers and other parties as an attempt to validate the JIF, but none have achieved reasonable reconciliation. The lack of reproducibility stands in stark contrast to that key principle of scientific research. Many articles have been published in recent decades describing the shortcomings and failures of the JIF[1-4,7,8,10,13-18].

A limited number of journals are included in Web of Science, particularly biased towards English-language journals published in the United Kingdom and the United States. Articles published in English language or published by an author with a conventional English name increase the likelihood of citation[9,13,19]. Incorrectly referenced articles may account for up to a third of references, reducing the chances of citations being counted correctly and predisposing readers to discard "low-impact" journals that may not have a presumably higher "quality" compared to "high-impact" journals, but which may still contain a number of "high-quality" articles. A journal's JIF is not associated with factors such as the quality of the process of peer review and the quality of the content of the magazine. Fernández Limón notes the importance of remembering the General Recommendation of the San Francisco Declaration that warns that people "do not use journal-based metrics [...] // [...] to evaluate the contributions of an individual scientist [...]"[10,13,16-18,20,21].

The way we search has changed. If a library did not have a local copy of a certain magazine, the next step was to wait days or weeks after requesting one. During that time, the Journal Impact Factor was a useful tool, as a library could better utilize its budget to maintain a selection of magazine subscriptions that would likely meet most of its readers' needs. With the proliferation of computers and the Internet, one can now generate thousands of relevant results in a very short time. Filtering by authors, publication year, keywords, and several other options allows for more accurate queries. The breadth offered by the search for modern literature has changed the search mechanics from the orientation to journals to the orientation to articles, and with that change, the JIF has lost value. At this moment, PubMed seems to be the most widely used platform for primary literature search. It contains more than 30.1 million records dating back to 1800 and represents more than 7,000 journals. When thinking about relevance, Google Scholar provides nearly three times as many links to full-text documents as PubMed. We can state that Google Scholar has become a formidable competitor to PubMed[3,22-25].

The phenomenon of Open Access

Over time, access to academic journals has been made through pay-per-subscription from universities, libraries, or by individual memberships in various societies and organizations. The costs of these subscriptions are high and are based on the overhead of administration, printing and distribution of journals' physical copies. Even if the shift towards online access has allowed for a decrease in overall costs, subscription prices have risen from year to year. This has been compounded by the added nature of many magazines being bought by large corporations focused on generating profits. In 2012, it was reported that Elsevier had a profit of $3.2 billion with a margin of 38%[1]. In the current era, the prestige aspects in scientific journals are handled with advertising or "marketing" indicator associated with their impact factor. However, publishers in a tendentious way incite coercive self-citation[26]. Large university presses and independent journals – at least until Springer's acquisition of Nature – have made the prestige and reputation its main commercial asset[27].

From the moment that aspects of surplus value were included in scientific publications, large corporations profited excessively from it. One of the best-known examples of the burden of restrictive access to scientific literature was the case of Aaron Swartz, a Harvard researcher, who committed suicide after being charged with a federal crime with a maximum penalty of $1 million and up to 35 years

in prison. In 2011, Swartz was accused of electronic fraud after downloading millions of academic journals by connecting a computer to the Massachusetts Institute of Technology network. This event triggered the "crisis of awareness for open access", as many politicians and institutions applauded his efforts in the fight for scientific information open access and began advocating for the Open Access (OA) model. After Swartz death, many universities such as Harvard are now advising their academics to submit the scientific work to journals published in OA regime. In 2013, the White House Office of Technology and Policy passed legislation making available to the public the results of certain federally funded research studies within a year[1,28].

Nowadays, there is a strong movement towards a hybrid model of OA as a means of distributing academic literature. In this model, some articles published in a journal can be accessed in OA while the rest are available only to subscribers. The authors have the option to pay an article processing charges (APC) to make their article available as an OA. Thomas Walker was the first who proposed and adopted the hybrid model concept in the first hybrid journal, Florida Entomologist, created in 1988. Since then, the hybrid concept has gained increasing popularity because it can offer a double benefit. It allows the authors to make their articles available to a wider audience and, at the same time, maintains the perceived prestige of publishing in a recognized journal with a high impact factor. According to a study by Springer Nature, OA articles in hybrid journals were estimated to generate 4 times more downloads, 1.6 times more citations, and 2.4 times more attention than those who are not freely available. However, the disadvantage for authors is that ACPs in hybrid journals average around $2,700, which is about double the cost of publishing in a full open access without subscription (around $1,400)[29-31].

From the introduction of the concept, new tools and initiatives have been created to encourage the scientific community to publish Open Access articles. As the researchers begin to adapt to a more open access method of information sharing, it is inevitable that the JIF will need to be reconsidered or replaced. However, the absence of international regulations and commercial interests that outweigh scientists has promoted the influx of predatory journals and along with it, a substantial increase in the number of poor-quality journals with only commercial interests, representing a risk to international academic communication[32-34].

Currently, there are several alternative metrics, but none of them cannot yet replace the JIF. These are called Altmetrics and usually take into account variables such as article downloads, news citations, social networks, blogs, social bookmarks, referral management services and others. The Eigenfactor is a metric tool developed to calculate JIF with three main differences: it includes citations in social sciences, discounts self-citations, and gives greater weight to citations from high-ranking journals. To make the distinction simple, JIF is usually seen as an answer to the question "How many people will read my article?", while the Eigenfactor answers the question "How many people will read the magazine in which my article is published?"[35-39].

As authors, it is very important to reason from the above poured. The "appropriation" in the metric by small groups of publishers could facilitate a monopoly in the categorization of the quality of journals in the world, and also makes us fall as researchers to seek fiercely and excessively publish in prestigious journals, reducing the possibility of growth of our journals at the regional level, just to achieve this "dream", without considering the great biases that the IF classifications have. The regionalization in the quality of scientific journals is a point of great importance that we propose, to distinguish by geographical area a level of quality of scientific journals.

Conclusions

The way scientific writings are disseminated and communicated has changed, and with it, changes in the methods for evaluating the quality of scientific journals and their content must be urged.

Open or hybrid access of journals is an effort initiated by some researchers, such as Aaron Swartz and Thomas Walker, which along with the increase in electronic communication have represented important changes in access and citing to scientific articles.

It is necessary to re-evaluate, analyse and reflect on the way in which the metrics in scientific journals are established, given that the way in which it is currently performed (for more than 60 years) and the fact that it does not longer fit in the advance of new technologies for the dissemination of knowledge.

Funding: This article has been funded by the authors.

Ethical aspects: This is a bibliographic review, which did not involve research on human beings. We seek to carry out an impartial analysis with ethical attachment and scientific integrity.

Acknowledgements: We thank the Mexican Social Security Institute for the facility it gives us to carry out academic and professional training activities.

Contribution of authors: Juan Antonio Lugo-Machado: conception, search and structure of the manuscript. Elizabeth Medina-Valentón and Rocío López-López: structure, adequacy and revision of the paper. Rocío López-López and Esmeralda

Ortega Villa: review and writing of the final paper.

Conflict of interests: The authors report no conflict of interests.

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