Journal Impact Factor: Uses and Misuses

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“In 1955, it did not occur to me that ‘impact’ would one day become so controversial. Like nuclear energy, the impact factor is a mixed blessing; I expected it to be used constructively while recognizing that in the wrong hands it might be abused.”

Eugene Garfield, 2005, *Founder and Chairman Emeritus, ISI

As a lecturer of biomedical writing, I have usually been asked about the impact factor of journals and how authors can publish their scientific manuscripts in journals with high impact factors. This is particularly important for faculty members since recently, many officials in Iran evaluate the scientific merit of an article based on the impact factor of the journal that published it. Sometimes, this issue is not confined to Iran and is a common practice in some other countries. To see whether it is reasonable to use the journal impact factor to determine the value of an article or evaluation of researchers or research centers, let us see what this index really is.

In 1955, Eugene Garfield created the “journal impact factor.” The impact factor of a journal reflects the frequency with which the journal’s articles are cited in scientific literature. A journal’s impact factor is a quotient the numerator of which is the number of citations in the current year to items published in the previous two years in the journal; the denominator is the number of substantive articles published within the same two years in the journal. For example, assume that in year 2008, there were 500 citations to items published in 2006–2007 in a journal and that the journal published 100 substantive articles in 2006–2007; then, the 2008 impact factor of that journal is 5 (=500/100). Each year, this index is calculated and reported in Journal Citation Report (JCR) by Thomson Scientific (formerly Thomson ISI) for over 8000 journals. This index reflects the average number of citations that each article published in the previous two years in that journal has received.

Those in favor of using impact factor for evaluating an article, in fact assume that publication in a high impact journal indicates greater scientific merit. This assumption would be correct if the citation rate of individual articles published in a journal have a narrow (preferably normal) distribution. Nonetheless, it has been shown that this is not the case; the distribution is very skewed so that the most cited half of the articles are cited almost 10 times as often as those least cited. Furthermore, it was shown that the impact factor of a journal does not affect the citation rate of an article.

Another point is that if the citation rate of an article is high, it does not necessarily mean that the article is of great scientific value; many non-scientific articles on controversial issues receive numerous citations. Furthermore, the Thomson Scientific, the body which calculates and reports the impact factor, clearly states that “drawing conclusions about individual performance is not the proper way to interpret impact factor.” Finally, the value of the journal impact factor, even as a metric for evaluation of journal quality, is also under question.

Based on the current evidence, I therefore believe that for the time being, for evaluation of scientific quality of an article, researcher, or research center, there is no alternative but to seek expert opinion of qualified peer reviewers.

References

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