

## Journal impact factor

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### INTRODUCTION

Art and science of biomedical publication has rapidly changed with the advent of information technology. ‘Journal impact factor’ assesses the performance of a biomedical journal. This article reviews and analyzes this subject and suggests measures for improving them. Journal impact factor (JIF) is a journal quality assessment instrument monitored periodically by an organization called Thomson Scientific (formerly International Scientific Institute–ISI), Philadelphia, founded by Eugene Garfield.<sup>[1,2]</sup>

The impact of an article on the reader can be understood using Miller’s Pyramid<sup>[3,4]</sup> to access the levels of awareness [Table 1]. Only a few publications can reach to the level 4 or 5 where the published literature is utilized in practice. Impact is primarily a measure of scientific utility rather than scientific quality.<sup>[5]</sup> Originality and merit are the fundamental principles that determine the quality of an article.

**Table 1: Illustrates degree of impact of an article on the reader**

Levels/degree of impact	Impact on the reader	What reader has done OR How reader has utilized the article
I	Heard of	Not analyzed
II	Knows of	Partially analyzed
III	Knows how	Completely analyzed (Not practiced)
IV	Shows how	Practiced
V	Does	Practices

Journals offering priority to them are highly cited and ranked. The reliability of JIF as an indicator for journal quality is sometimes debated.<sup>[6]</sup> However, in the absence of a suitable alternative, JIF continues to be the indicator for a journal’s performance.

### JIF EQUATION

In 1927 Gross and Gross introduced the concept of counting references to rank scientific journals.<sup>[7]</sup> In 1955 Eugene Garfield suggested citation counting could measure impact.<sup>[2]</sup> Garfield introduced the term Impact Factor in 1963.<sup>[8]</sup> Citation indicates an article has influenced scientific community as illustrated in Table 1. Greater the frequency of an article being cited, higher will be its influence on the scientific community.<sup>[9]</sup> Citation is the total number of times an article is used as a reference and cited in the previous 2 years from the given year for which it is calculated.<sup>[11]</sup> If an article ‘A’ from IJDVL is cited 3 times in 2003 and 5 times in 2004, citation for article ‘A’ in 2005 is 8. Only research articles, original case reports, technical notes and reviews are citable items of a journal.<sup>[8-10]</sup> Commentaries, editorials, correspondence/ letters to editors are ‘non-citable.’

### CALCULATION

According to ISI,<sup>[11]</sup> JIF is a quantitative measurement, a ratio, and not a number. The performance of an article is measured by citations; however, a journal is

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assessed by impact factor. It is the ratio of the total number of citations in the previous 2 years from the given year for which it is calculated to all the citable articles published in those 2 years.

## ROLE OF REVIEW AND RESEARCH ARTICLES

From the above equation, it is clear that reduction in the number of citable articles in denominator will increase JIF.<sup>[9,10]</sup> Consequently, editorial board is compelled to look for priority among citable articles they receive. Lack of originality in citable articles may reduce the JIF. Consequently, the editorial board will prefer manuscripts with high priority that earns a good impact. JAMA's JIF was 4.8 in 1989 with 650 citable articles. In 2001 its JIF increased to 17.6 with 389 citable articles.<sup>[11]</sup> Increased publication volume in 1997 at the Lancet reduced JIF.<sup>[12]</sup> Reduction in publication volume increases JIF. Hence editors should restrict the number of review and original articles unless they are of exceptionally high standard.

## REVIEWS SCORE OVER RESEARCH ARTICLES

Among citable articles, reviews are commonly cited than original research papers.<sup>[13]</sup> As reviews focus on various aspects and are an amalgamation of several original works of a topic in depth, they are usually cited.<sup>[14]</sup> Moreover, they form the core of a journal issue. Therefore, most reviews that are invited are authoritative or require prior editorial consent before submission.

## ROLE OF LETTERS AND EDITORIALS

Since letters and editorials are included in the numerator, they increase JIF. Citation to non-citable items increases the JIF. With a minimum space investment, they fetch a good JIF. Hence potential submissions as letters are usually accepted. Letters may be a) notes or b) comments and opinions. Submitted original articles with pilot studies, reports with less statistical data where further confirmation on large studies and brief reports are required are included in 'Notes' section. It is this category of letters that increases the citation density (average number

of citations/article). The editors restrict comments and opinions except in special situation where the author has effectively illustrated with originality or it is authoritative and informative.

## TYPE OF RESEARCH ARTICLES

Basic science subjects like biochemistry, cell biology and immunology have a very high JIF. A comparison of JIF among basic science, General medical and Dermatology journals are illustrated in Table 2. When JIF are compared across various journals [Table 2], basic science journal and specialty journal vary. JIF is not an indicator for any comparison between different specialties journals. Higher the degree of journal's specialization, lesser will be the JIF. JIF of general medical journals like New England Journal of Medicine, JAMA, LANCET and British Medical Journal should not be compared with specialty journals like Archives of Dermatology or British Journal of Surgery. Similarly a sub-specialty journal should not be compared with its parent specialty journal. Contact dermatitis or cutaneous surgery or pediatric dermatology journal cannot be compared with Archives of Dermatology or British Journal of Dermatology.

Journal of investigative dermatology publishes articles related to basic cutaneous research. Hence, it is highly

**Table 2: Illustrates the impact factor distribution pattern across basic science, general medical and dermatology journals**

Journal category	Impact
A. Basic science	
1. Annual Review of Immunology	52.2
2. Annual Review of Biochemistry	37.6
3. Physiological Reviews	36.8
4. Nature Reviews. Molecular Cell biology	35.0
5. Nature Reviews. Cancer	34.0
B. General medical journals	
1. New England Journal of Medicine	34.8
2. Cancer Journal for Clinicians	33.0
3. Nature Medicine	30.0
4. JAMA	21.5
5. Lancet	18.0
C. Dermatology journals	
1. Journal of Investigative Dermatology	4.2
2. Archives of Dermatology	3.5
3. Journal of American Academy of Dermatology	3.0
4. British Journal of Dermatology	2.6
5. AIDS Research and Human Retroviruses	2.3
6. International Journal of Dermatology	0.7

Data is based on journal citation reports of 2003

ranked [Table 2]. British Journal of Dermatology [Table 2] has shown better performance in recent times by significantly incorporating basic science articles.

### ONLINE AVAILABILITY OF FULL TEXT ARTICLES

It increases circulation and readership of the journal. It has been demonstrated to increase the JIF.<sup>[15,16]</sup> It can be FUTON (full text on the net), Abs (abstract only on net) or NAA (non-availability of abstracts). Free FUTON increases the JIF [Table 3] and enables rapid dissemination. Hence upcoming journals encourage open access without any subscription fee, as the information is immediately accessed and cited by authors.

### LENGTH, CONCISENESS AND STYLE OF MANUSCRIPTS

Concise manuscript is not shortened manuscript. It is an art and science where author puts across the data and effectively analyzes it with least possible words and delivers the message. Most of the journals have their own style. Citation density is usually directly proportional to the conciseness and length of the manuscript.<sup>[1,8]</sup>

### SELF-CITATION

A significant correlation between self-citation rate and impact factors of orthopedic,<sup>[17]</sup> anesthesia<sup>[18]</sup> and European<sup>[19]</sup> journals has been illustrated. Although

self-citation increases the JIF, editors can obtain declaration by authors and reviewers and verify its relevancy and appropriateness. This process increases transparency in publication.

### RAPID REVIEW AND EARLY ONLINE PUBLICATION

This process facilitates early attention of potential authors who can analyze and cite it.<sup>[15,19]</sup> Selected articles can be placed for fast-track publication. Reduction in publication lag time increases JIF. Based on the above principle, JAAD has pre-blue section for high-impact articles.

### FREE RIDE HYPOTHESIS

Journals do not offer any free ride. It is an illusion to assume that publication in a high impact journal will enhance the impact of the article. Citation rate of an article increases the JIF, but not vice versa.<sup>[20]</sup> All the articles of a high quality journal will not have high citations. Skew distributions of citations were noticed in the Nature journal.<sup>[21]</sup>

### PREVENTION OF BRAIN DRAIN OF QUALITY ARTICLES

'Publish in India' campaign,<sup>[22]</sup> i.e., encouragement to publish in Indian journals, should be initiated. Periodic requests should be made to academic institutions to publish best of authors' works in Indian journals. Effective campaign can prevent brain drain of excellent articles.

### WHO IS RESPONSIBLE FOR JIF?

Contributors should be aware of editorial board commitment to JIF and prepare the manuscript accordingly. Medline has listed 4,600 journals among 126,000 science journals published worldwide.<sup>[23]</sup> Indian journals with good JIF are Current Science of India, National Medical Journal of India, Indian Journal of Medical Research and recently included Indian Pediatrics<sup>[24]</sup> and Journal of Postgraduate Medicine. Recently our journal is indexed and has begun to make impact.

**Table 3: Measures to improve the journal impact factor**

- Incorporate applied basic science articles related to skin
- Increase letters to editors based on case notes or studies
- Discourage comments and opinions type of letters
- Restrict the number of review and original articles
- Encourage publishing only authoritative commentaries or editorials related to studies published on that issue
- Free full text online access (FUTON) of all articles
- Encourage conciseness of articles
- Tap academic institutions both in India and Overseas and encourage submitting manuscripts, especially basic science articles that relate to skin
- Publishing debate oriented articles or controversies
- Publishing articles describing methods or techniques
- Permit relevant self-citation
- Rapid review and early online publication
- Prevent brain drain of quality articles
- Introduce what the article adds to the table of contents

Authors, reviewers and editors all work to publish and update the existing level of knowledge in the literature in the interest of fellow physicians and patients. Authors should realize the importance of JIF. The editorial board should be more concerned and thus encourage authors to render their highest quality contributions and consequently increase the performance of the journal.

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### Author Help: Choosing an appropriate category of article for faster publication

The manuscript system ([www.journalonweb.com](http://www.journalonweb.com)) allows the authors to check a likely publication date for a newly submitted article. Based on number of articles in review, number of accepted articles and acceptance rate, the system estimates the likely publication date for an article submitted on a given date.

If there are too many articles in a category e.g., case report, a newly submitted case report if accepted may have to wait for a long period before publication. Hence, the author can check other categories e.g. letter to editor or images, for such paper and submit to another category of articles.