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### Scientific journals: Indexation and impact factor

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Sir,

Your recent publication 'Indexed Journal: What does it mean?' is really stimulating. Balhara Yatan compared the values of indexation of a journal and their impact factors IF.<sup>[1]</sup> It is true that both are related and important, but the question is 'how objective are these?' According to Balhara, popular indexation services that have been for a long time such as Medline/Pubmed, EMBASE, SCOPUS, EBSCO Publishing's Electronic Database, SCIRUS, and African Index Medicus were regarded as highly rated. He

subsequently asked if the newer indexation services like Capsur, DOAJ, SCOLAR, Primo Central, ProQuest, Hinari, Open J Gate and some others are equally relevant bodies.<sup>[1]</sup> The question still remains 'how objective are we?'

Indexation services are meant to give journals wider coverage for easy accessibility to their published articles. Bearing this in mind, we can regard all indexation bodies as equally relevant. However, the coverage capacities of these bodies differ. Indexing/abstracting bodies like Pubmed has over the years grown to be globally acceptable

and now has a broader horizon. Similarly are EMBASE and SCOPUS. This has put them on a hedge over newer indexation services. If the newer indexing bodies would continually strive to maintain quality and integrity, then they will also grow with time.

IF is yet another controversial issue.<sup>[2]</sup> IF has evolved from the original intention of using it as a measure of journal performance<sup>[3]</sup> to being used as a proxy for the relative importance of a journal within its field.<sup>[1]</sup> It is now employed as a yardstick to evaluate article and scientist. How true are the values? Garfield has warned against using IF to evaluate individual articles and scientists.<sup>[4-6]</sup> IF has been criticized for falseness and inappropriate application.<sup>[7]</sup> IF is not just awarded to journals indexed in Thomson Reuters Journal Citation Reports (ISI-Thomson), it is also awarded by SCImago Journal Ranking (SJR). Both are issued by Elsevier.<sup>[8]</sup> SJR calculates IF based on a periodic citation data and attributes different weight to citations depending on the citing journal using the Page Rank algorithm in the network of journals. The prestige of a journal is transferred through the references that a journal receives from others.<sup>[8]</sup>

$$IF = C/D = C_{(N)} / (A_{(N-2)} + A_{(N-1)}) \quad (1)$$

where  $C_{(N)}$  is total number of cites appearing in journals from each respective collection to articles published by journal 'J' in years '(N-2)' and '(N-1)', and  $A_{(N-i)}$  is the number of articles published by 'J' in years (N-2) and (N-1).<sup>[8]</sup>

Some journals now calculate IF using the same basis as:

$$IF(N) = A/B \quad (2)$$

where N is the year, A is the number of times articles published in years 'N-1' and 'N-2' were cited in indexed journals during year 'N', and 'B' is the number of articles, reviews, and proceedings or notes published by the journal in years 'N-1' and 'N-2'.

Which IF do we then accept? That from ISI-Thomson or SCImago? Possibly, that generated by individual journal? Interestingly, journals now have impact ICV ratings/values on their official websites. Researchers are often confused and mistake this for IF.

Multiple factors have been reported to bias the calculation of IF. These include but are not limited to coverage and language preference of the database, procedures used to collect citations, algorithm used to calculate IF, citation distribution of journals, online availability of publications, negative citations, preference of journal publishers for articles of a certain type, publication lag, citing behavior across subjects, and possibility of exertion of influence from journal editors.<sup>[9,10]</sup> These factors might also play a role in journal indexation.

Since some journals are indexed in highly rated indexation services like Pubmed but have low or no IF, while some have high IF but are not indexed in Pubmed, what are the selection criteria for labeling a journal 'high quality journal'? Indexation or IF? This makes the ranking of journal quality opinionative and highly subjective. Emphasis should be placed on evaluation and peer-review processes, and the consistence of journals as these will certainly yield good publications. Anecdotal evidence shows that some journals are worth labeling 'high quality' based on unbiased and constructive peer-review process but are not well indexed probably due to the factors earlier stated. How would such journals have high coverage or IF?

It is good to publish in journals indexed in highly rated indexing/abstracting bodies as well as those with high IF, however, the bone of contention should be shifted and value should be placed on quality evaluation and peer-review processes. It is suggested that if there is a need for IF, associations of editors of medical journals should play a vital role in ensuring that indexation bodies have a fair, open, and clear selection criteria, and a standard formula for calculating IF should be established. These will bring the actual picture of journals' impact.

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