Comparison of ISI web of knowledge, SCOPUS, and Google Scholar h-indices of Iranian nuclear medicine scientists

Leili Zarifmahmoudi and Ramin Sadeghi

Nuclear Medicine Research Center, Faculty of Medicine,
Mashhad University of Medical Sciences, Mashhad, Iran

Original Article

ABSTRACT

Introduction: In the current study, we compared the h-indices of Web of Science (WOS), SCOPUS, and GS of the Iranian nuclear medicine scientists

Methods: Full time members of two major nuclear medicine research centers of Iran with more than 5 year of experience (Nuclear Medicine Research Center of Mashhad University of Medical Sciences, and Research Institute for Nuclear Medicine of Tehran University of Medical Sciences) were included for h-index evaluation. H-indices of SCOPUS, WOS and GS were retrieved using their specific websites. Correlations of h-indices with each other were evaluated using spearman correlation coefficient.

Results: Overall 11 researchers were included in the study. SCOPUS, WOS, and GS provided somehow different h-indices for each researcher. Spearman's correlation coefficients between different h-indices were high: 0.834, 0.817, 0.857 between SCOPUS and WOS, SCOPUS and GS, and GS and WOS respectively. Rankings of researchers according to different database however, were acceptably identical.

Conclusion: H-indices provided by SCOPUS, Web of Science WOS, and Google Scholar (GS) for Iranian nuclear medicine researchers can be used interchangeably. However these h-indices can be different according to which database is used. Setting up "ReasercherID" in WOS and "User profile" in GS, as well as giving regular feedback to SCOPUS managers can increase the accuracy of h-indices calculation.

Key words: SCOPUS, ISI, Web of science, Google scholar, Nuclear medicine, Iran, H-index.

Corresponding author: Dr Ramin Sadeghi, Nuclear Medicine Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran. E-mail: sadeghir@mums.ac.ir

INTRODUCTION

In the scientific world, researchers are evaluated by citation tracking of their publications. Promotion in the scientific career and allocation of research grants are usually decided by the number of publications as well as citations to those articles [1]. For better citation tracking of individual scientists several indices have been developed and are in use [2]. H-index is the most frequently used item for this purpose proposed by Hirsch JE in 2005 [3]. It is defined as "the highest number of h papers that have received at least h citations."[4]. Web of Science (WOS) was traditionally the only resource for calculating h-index. However in the recent years, SCOPUS [5] and Google Scholar (GS) [6] have provided their own h-index for individual researchers. These databases have their own specific coverage [7] and the h-indices of each would differ accordingly.

In the current study, we compared the h-indices of WOS, SCOPUS, and GS of the Iranian nuclear medicine scientists.

METHODS

Full time members of two major nuclear medicine research centers of Iran with more than 5 year of experience (Nuclear Medicine Research Center of Mashhad University of Medical Sciences, and Research Institute for Nuclear Medicine of Tehran University of Medical Sciences) were included for h-index evaluation.

H-indices of SCOPUS, WOS and GS were retrieved using their specific websites [5, 6]. "Author finder" utility of ISI was used for identifying specific researchers. If the researchers had ResearcherID profile, its h-index was used. Otherwise the articles authored by the researcher were retrieved manually.

"Author search" tab of SCOPUS was used to locate specific researchers. For those researchers with several author matches, all author sets were used for h-index calculation. If researchers had their own "user profile" in GS, it was used for h-index calculation. Otherwise "Advanced search" of GS was used for identifying individual researchers using the "Return articles written by" tab [8]. Correlations of h-indices with each other were evaluated using spearman correlation coefficient. Statistical analyses were done using SPSS version 11.5.

RESULTS

Overall 11 researchers were included in the study (5 from Mashhad University of Medical Sciences and 6 from Tehran University of Medical Sciences).

Table 1 shows the h-indices as well as the ranks of the individual researchers. Spearmans correlation coefficients between different h-indices were high: 0.834, 0.817, 0.857 between SCOPUS and WOS, SCOPUS and GS, and GS and WOS respectively.

Table 1. H-indices and the ranks of individual researchers.

Researcher	Web of Science h-index	Web of Science h-index rank	SCOPUS h-index	SCOPUS h-index rank	Google Scholar h-index	Google Scholar h-index rank
Ay MR	7.00	1.000	8.00	1.000	7.00	1.000
Saghari M	5.00	3.000	7.00	2.000	7.00	1.000
Eftekhari M	5.00	3.000	7.00	2.000	7.00	1.000
Sadeghi R	4.00	4.000	6.00	3.000	6.00	2.000
Kakhki VRD	4.00	4.000	6.00	3.000	7.00	1.000
Zakavi R	6.00	2.000	6.00	3.000	7.00	1.000
Fallahi B	4.00	4.000	6.00	3.000	5.00	3.000
Beiki D	5.00	3.000	6.00	3.000	7.00	1.000
Fard-Esfahani A	4.00	4.000	5.00	4.000	5.00	3.000
Aryana K	1.00	5.000	2.00	5.000	1.00	5.000
Momennezhad M	1.00	5.000	2.00	5.000	2.00	4.000

DISCUSSION

Citation tracking of researchers is a known method for ranking and assign importance to the scientific career of scientists. H-index is a metrics widely used and as mentioned above can be obtained from various sources [4, 9]. WOS, SCOPUS, and GS are three major sources which provide h-index for individual researchers. Although WOS has been used traditionally to calculate h-index, other sources are gaining much popularity in the scientific world [10]. The h-indices provided by these sources can differ from each other dramatically. Our result also showed that h-indices of Iranian nuclear medicine scientists differ according to the source. The reason of this variability is most likely different coverage of the above-mentioned databases [10, 11]. WOS has the least extensive coverage of material and GS has largest collection of citations and SCOPUS is in between. GS even include books and other tracable materials in its citations which increase its coverage dramatically. For example one of the citations to Jangjoo et al study [12] co-authored by Sadeghi R in GS [13], is a book which could not be find by SCOPUS or WOS. This was also confirmed by our results as GS h-indices were the highest and WOS h-indices were the lowest in our study. Another important factor which should be considered is the way the above-mentioned sources arrange the citations under the name of a specific author. SCOPUS is the most powerful since it has its own author identifier which can be modified by the users. For example searching "Sadeghi R" in SCOPUS as an author will yield one author group which includes several author names (Ramin S, Sadeghi Ramin, Sadeghi R, etc). This can be done by asking SCOPUS managers to merge different author names under a single author ID. We can compare it to Momennezhad M who didn't merge his own articles under one author ID. To find all of the articles authored by Momennezhad M we should search both "Momennezhad M" and "Momennejad M". The problem of different (and usually wrong) author names is very common among Iranian researchers since the Iranian names are not familiar with the Journal and databases editors especially having in mind that Iranians do not have middle name as the Western researchers do.

WOS has another method of gathering articles of researchers under one ID which is called ResearcherID. Unfortunately it is not automatically updated by ISI and researchers should sign up and update the data in WOS themselves. Among the Iranian nuclear medicine researchers only Sadeghi R had ResearcherID. This is a major problem while calculating WOS h-index for researchers since there is no way to find articles authored by a specific author besides checking articles possibly authored by the researcher.

GS also has its own user profiles to identify individual authors. These profiles should be set up by the researchers themselves. GS would automatically update these profiles. This option is of utmost importance since searching GS without User profile of the author would be very hard and sometimes impossible due to huge number of irrelevant articles in each author search. Among Iranian nuclear medicine researchers only 4 had GS "User profile" (Sadeghi R, Kakhki VRD, Zakavi SR, Aryana K). This is most likely the reason of equal GS h-index of Ay MR compared to Zakavi R and Kakhki VRD despite higher WOS and SCOPUS h-indices.

Another important issue to be considered while using h-index is the scientific age of the researchers. Usually researchers with longer experience in the field of research would have higher chance to be cited. This was also true in our study since Saghari M, Eftekhari M, and Zakavi R had higher h-indices compared to the junior researchers.

Despite differences in the h-indices provided by different databases, the correlations between these indices were high (>0.8) and it seems that they can be used interchangeably. The ranks of each researcher in different databases were almost the same and the differences are most likely due to not being able to locate some of the articles authored by researchers (the reason is lack of ResearcherID for WOS or User profile for GS).

CONCLUSION

H-indices provided by SCOPUS, WOS, and GS for Iranian nuclear medicine researchers can be used interchangeably. However these h-indices can be different according to which database is used. Setting up "ReasercherID" in WOS and "User profile" in GS, as well as giving regular feedback to SCOPUS managers can increase the accuracy of h-indices calculation.

REFERENCES

1. Ascaso Puyuelo FJ. H-index in the evaluation of individual scientific output. Arch Soc Esp Oftalmol. 2010 Sep;85(9):310.

2. Abbas AM. Bounds and inequalities relating h-index, g-index, e-index and generalized impact factor: an improvement over existing models. PLoS One. 2012;7(4):e33699.

3. Hirsch JE. An index to quantify an individual's scientific research output. Proc Natl Acad Sci U S A. 2005 Nov 15;102(46):16569-72.

4. Franceschet M. A comparison of bibliometric indicators for computer science scholars and journals on Web of

Science and Google Scholar. Scientometrics. 2010;83(1):243-58.

5. www.scopus.com.

6. www.scholar.google.com.

7. Ramin S, Sarraf Shirazi A. Comparison between Impact factor, SCImago journal rank indicator and Eigenfactor score of nuclear medicine journals. Nucl Med Rev Cent East Eur. 2012 Aug 27;15(2):132-6.

8. http://scholar.google.com/advanced_scholar_search?hl= en&as_sdt=0.

9. Miró O, Martín-Sánchez FJ. Impact factor, H-index and other variable to observe the relative importance of an investigator. Rev Clin Esp. 2012 Jan;212(1):48-9.

10. De Groote SL, Raszewski R. Coverage of Google Scholar, Scopus, and Web of Science: A case study of the h-index in nursing. Nurs Outlook. 2012 Jun 29.

11. Poynard T, Thabut D, Jabre P, Munteanu M, Ratziu V, Benhamou Y, Deckmyn O. Ranking hepatologists: which Hirsch's h-index to prevent the "e-crise de foi-e"? Clin Res Hepatol Gastroenterol. 2011 May;35(5):375-86.

12. Jangjoo A, Forghani MN, Mehrabibahar M, Sadeghi R. Anaphylaxis reaction of a breast cancer patient to methylene blue during breast surgery with sentinel node mapping. Acta Oncol. 2010 Aug;49(6):877-8.

13. http://scholar.google.com/scholar?oi=bibs&hl=en&cites =17283367146458501584.