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Factors Affecting Journal Quality Indicator in Scopus (SCImago Journal Rank) in Obstetrics and Gynecology Journals: a Longitudinal Study (1999–2013)

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ABSTRACT

Introduction: Awareness of the latest scientific research and publishing articles in top journals is one of the major concerns of health researchers. In this study, we first introduced top journals of obstetrics and gynecology field based on their Impact Factor (IF), Eigenfactor Score (ES) and SCImago Journal Rank (SJR) indicator indexed in Scopus databases and then the scientometric features of longitudinal changes of SJR in this field were presented. **Method and material:** In our analytical and bibiliometric study, we included all the journals of obstetrics and gynecology field which were indexed by Scopus from 1999 to 2013. The scientometric features in Scopus were derived from SCImago Institute and IF and ES were obtained from Journal Citation Report through the Institute for Scientific Information. Generalized Estimating Equation was used to assess the scientometric features affecting SJR. **Result:** From 256 journals reviewed, 54.2% and 41.8% were indexed in the Pubmed and the Web of Sciences, respectively. Human Reproduction Update based on the IF (5.924±2.542) and SJR (2.682±1.185), and American Journal of obstetrics and gynecology based on the ES (0.05685±0.00633) obtained the first rank among the other journals. Time, Index in Pubmed, H_index, Citable per Document, Cites per Document, and IF affected changes of SJR in the period of study. **Discussion:** Our study showed a significant association between SJR and scientometric features in obstetrics and gynecology journals. According to this relationship, SJR may be an appropriate index for assessing journal quality.
Key words: Journal quality, obstetrics and gynecology, Impact Factor, Eigenfactor Score, SCImago Journal Rank.

1. INTRODUCTION

Journals have notable importance in the scientific world due to releasing the latest scientific articles on a wide range of specific domains in certain short intervals. Publishing articles in a scientific journal is considered as the quality indicator of the researchers' activities, too.

Regarding the researchers' demand in health sciences and medical related fields for the latest scientific researches' findings, the international databases are the first entry to achieve this goal. One of the methods of assessing scientific journals as pioneers in promoting science as well as scientific products is the information databases which index a journal (1).

Quality evaluation of journals in different disciplines can help researchers to decide easier while choosing an appropriate journal for publishing their scientific results. The Institute for Scientific Information (ISI) and Scopus are known as the two most powerful citation indexing databases dealing with the quality and quantity evaluation and ranking of journals through indices, including: Impact factor (IF), SCImago Journal Rank (SJR), and Eigenfactor score (ES).

Among the journals' evaluation indices in Web of Sciences (WoS), we can refer to IF as the most well-known and commonly used criterion for considering the journals' quality and scientific impact of scholarly literature which was firstly proposed by Garfield in 1955 (2). IF is a ratio of the number of receiving citations to published papers during a 2 year period (3). Despite the general acceptance of IF in the scientific com-

munities, there are controversial issues regarding IF which have been reviewed over time. The type of article and impact of the type of article cited the article, self-citation, total number of citable items, citation to non-citable items, and English language bias are factors affecting the IF that are critical (4, 5, 6).

SJR index proposed by the SCImago research laboratory in Spain in 2007 is calculated based on the data from Scopus citation database. The calculation of the SJR is more complex than IF and seems to be similar to the Google page rank algorithm. SJR is obtained through the number as well as the importance of receiving citations to published papers in a journal during a 3 year period (7).

ES is another journal quality indicator that uses WoS indexed journals for quality assessment. ES has eliminated a number of the IF deficiencies by omitting journal self-citation impact, lengthening the time interval of calculation from two to five years, reflecting the impact of the prestigious citations as well as considering the indirect citations impact (8-14). Another merit of this index compared to the IF and SJR is its free accessibility (15).

The mentioned indicators are generally based on the number and importance of citations to articles in a certain time frame. Various factors can affect the number of citations of a journal, thereby affecting the indicators. Established history of the journal, the journal's indexing in the accredited database, rate of international cooperation, and country of

publication are considered as the most important of these factors (Ref). SJR, for the rectification of defects of IF and considering more journals than the ES, seems to be a more comprehensive index than the others. Previous studies have shown a relationship between these three scientometric indices (5, 16-19). So, we reassessed the longitudinal relationship between them in obstetrics and gynecology field.

So far, several studies have been conducted on reviewing the relationship between various journals' evaluation indices in different scientific areas, as well as determining the most appropriate indices in each specific field of study (5, 12, 17-22). However, a few studies have considered journals in obstetrics and gynecology field till now (16). Women make up half of the world's population. Women, compared to men, are more vulnerable to disease due to the physiological, emotional, mental and even spiritual reasons. Considering women's substantial role in maintaining family health, society, and future generations, in recent decades, women's health has turned into a hot topic of international organizations such as WHO, and health policy makers around the world. Research findings about women's health are published in various journals. Awareness of the top obstetrics and gynecology journals can help the researchers to find the valid studies faster and publish the results of their studies. In this study, we introduced the obstetrics and gynecology journals indexed in Scopus and WoS. Then, we evaluated the factors affecting the changes in the journals' evaluation indices.

2. METHODS AND MATERIALS

We conducted a study of scientometric features of 256 journals of obstetrics and gynecology from 1999 to 2013. The data were obtained from Journal Citation Report (JCR) through the ISI and official website of SCImago Journal and Country Rank. The list of obstetrics and gynecology journals indexed in Scopus database was derived from SCImago Institute accompanying their SJR index value and its relative factors (23). IF and ES were obtained from JCR through ISI. Information regarding the journals indexed in Pubmed was retrieved through the website of the U.S. National Library of Medicine (24).

Generalized estimating equation (GEE) was used to determine the factors. Country of publication, IF and year as their indexing, Eigenfactor, H_index, citations per document in a 3-year period, citable documents per document in a 3-year period, and the number of references per document during one year based on Scopus affected longitudinal changes of SJR.

GEE, an alternative to the likelihood–based generalized linear mixed model, is a technique used for analysis of longitudinal data. Parameter estimation of GEE is less sensitive than mixed models to outliers and the specification of the variance-covariance matrix structure (25).

All analyses were performed using SPSS, version 11.5.

3. RESULT

Within 15 years (1999_2013), from 256 obstetrics and gynecology journals indexed in the Scopus database, 54.2%

Rank	Journal	SJR	Journal	IF	Journal	ES
1	Hum Reprod Update	2.682 (1.185)	Hum Reprod Update	5.924 (2.542)	Am J Obstet Gynecol	0.05685 (0.00633)
2	Hum Reprod	1.879 (0.406)	J Sex Med	4.461 (0.999)	Obstet Gynecol	0.05256 (0.00380)
3	Obstet Gynecol	1.761 (0.386)	Hum Reprod	3.683 (0.622)	Fertil Steril	0.04919 (0.00443)
4	Am J Obstet Gynecol	1.605 (0.218)	Obstet Gynecol	3.654 (1.056)	Hum Reprod	0.04614 (0.00194)
5	BJOG	1.523 (0.280)	Fertil Steril	3.407 (0.486)	Gynecol Oncol	0.03878 (0.00140)
6	Mol Hum Reprod	1.468 (0.237)	Mol Hum Reprod	3.288 (0.622)	BJOG	0.02490 (0.00150)
7	Ultrasound Obstet Gynecol	1.433 (0.327)	Menopause	3.188 (0.599)	Reproduction	0.01676 (0.00126)
8	Fertil Steril	1.370 (0.151)	Arch Dis Child Fetal Neonatal Ed	3.121 (0.798)	Ultrasound Obstet Gynecol	0.01629 (0.00146)
9	Gynecol Oncol	1.319 (0.445)	Am J Obstet Gynecol	3.046 (0.488)	Hum Reprod Update	0.01309 (0.00095)
10	Contraception	1.272 (0.286)	Reproduction	2.977 (0.406)	J Sex Med	0.01275 (0.00440)

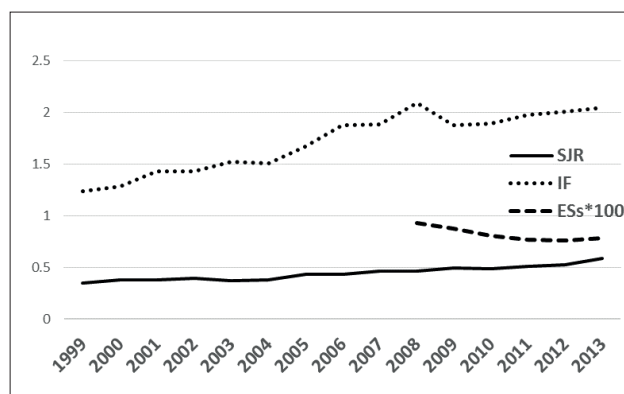Table 1. *10 top obstetrics and gynecology journals based on IF, SJR, and ES rankings*

Figure 1. *Trend IF, SJR, and ES*100 in obstetrics and gynecology journals during the study*

Parameter	Wald Chi-Square	P-value
Time	39.587	≤0.001*
Continental of publication	7.614	0.107
Index in WoS	2.235	0.135
Index in Pubmed	7.353	0.007*
H_index	27.394	≤0.001*
Average number of references	1.908	0.167
Citable per Doc (3 years)	12.136	≤0.001*
Cites per Doc (3 years)	257.547	≤0.001*
SelfCites per Citation (3 years)	2.067	0.105
International Collaboration (%)	1.044	0.307
IF	148.225	≤0.001*
ES	0.331	0.565

Table 2. *Correlated scientometric features with SJR changes derived by GEE. *Significant at 5%*

were indexed in Pubmed and 41.8% in WoS databases. 47.2% of the journals were published in the United Kingdom and United States. The mean IF, SJR, and ES of journals in obstetrics and gynecology field were 1.773±1.197, 0.448±0.477, and 0.00813±0.012, respectively. Human Reproduction Up-

date based on the IF (5.924±2.542) and SJR (2.682±1.185) and American Journal of obstetrics and gynecology based on the ES (0.05685 ± 0.006332) obtained the first rank among the other journals. Detailed information about ten distinguished obstetrics and gynecology journals based on IF, SJR, and ES ranking is presented in Table 1. During the study, SJR and IF increased and ES decreased. Figure 1 shows the means of the indices in the period studied.

The mean citations per document in a 3-year period, the citable documents per document in a 3-year period, the average number of references in an article, and H-index were 0.91±1.12, 0.89±0.12, 22.28±17.15, and 29.86±32.23, respectively. The mean number of journal's self-citations to its own documents published in a 3-year period and document ratio whose affiliation includes more than one country address were 46.04±146.67, and 8.50±10.32, respectively.

As shown in Table 2 the result of fitting GEE has shown that the Time, Index in Pubmed, H_index, Citable per Doc (3 years), Cites per Doc (3 years), and IF are variables that affect SJR in the period of the study.

4. DISCUSSION

IF and SJR are known as a citation rate measures and they are major criteria for quality ranking of the scientific journals. Despite the general acceptance of IF in the scientific communities, there are controversial issues regarding IF such as journals' self-citation impact, the limited calculating time interval and parallel consideration of citation impact in index calculation which were reviewed over time (5, 26-28). Other indices, such as SJR and ES, are proposed aiming at of alleviating the IF deficiencies. SJR index is calculated based on the data from Scopus citation database. Scopus, as an extensive database, indexes many journals from different countries and languages. SJR, unlike IF, is less affected by self-citation and includes all types of articles in its denominator, not only ISI citable items namely original and review articles (13, 26). In this study, we evaluated the factors affecting SJR in obstetrics and gynecology journals.

The results showed that the average IF of the journals in obstetrics and gynecology field (1.773) was more than that of the journals in other clinical fields, namely nephrology (1.64), and basic fields like immunology (0.14), and it was less than the IF of journals in cardiology (3.24) (29).

Human reproduction update journal, which was considered as the leading journal of obstetrics and gynecology field according to the IF and SJR ranking, was ranked the 9th based on the ES ranking. Based on the ES, American journal of obstetrics and gynecology was regarded as the most prominent journal of obstetrics and gynecology field, while it was ranked the 4th and 9th based on IF and SJR, respectively. These differences in journal ranking are based on the indices calculation methods, the differences in the indices calculation interval, considering the effect of journal self-citation and indirect citations as well as weighting mode to the citations.

Over time, two indices, i.e. IF and SJR, had increased, and ES has shown a decreasing trend.

Indexing in Pubmed was associated with changes of SJR. Free access to journals can lead to an increase in the number of their received citations. PubMed currently includes citations and abstracts from over 5650 life science journals for biomed-

ical articles back to 1948. Citations may include links to full-text content from PubMed Central (PMC) or publisher websites. Murali et al revealed that the IF of journals in cardiology, nephrology and immunology, which provide full text through Pubmed database, has received much more citations compared to the journals offering only the abstracts through the database (29).

H-index, an index for quantifying the scientific productivity of scientists, journals and scientific institutions based on their publication record (30), was correlated with SJR.

The average number of references in an article was not a significant related factor of SJR. It seems that the low and high number of references in an article has no effect on the SJR.

The percentage of citable document per document and citation per document in 3 years had a significant effect on SJR. Considering that SJR is calculated using a complicated iterative formula through the number as well as the importance of receiving citations to published papers in a journal during a 3-year period, the number of citations and cited published articles can justify their relationship with SJR (5).

The percentage of documents whose affiliation includes more than one country address, as an index for international collaboration, was not related to SJR. Perhaps one reason for this was a low percentage of international collaboration in the Obstetrics and Gynecology journals.

SJR excludes a journal with self-citations above 33% of the total received citation (31). This can be a justification for the lack of a significant relationship between SJR and the percentage of self-citation.

A meaningful relationship, as the scientometric studies in other fields, has been observed between SJR and IF. Previous studies in the field of oncology and nuclear medicine have shown the strong relationship between these two ranking indices of journals (18).

Our results showed that ES had no correlation with SJR. Among the evaluated journal quality metrics, ES does not have any denominator and it is sensitive to the total number of citable items. In other words, journals with a low number of articles are likely to have lower ES.

5. CONCLUSIONS

Nowadays, large numbers of journals in different fields of medical science poses a dilemma for researchers of health sciences in choosing the appropriate journal for publishing scientific results. Journal ranking indicators as scientometrics features can pave the way for appropriate journal selection by the researchers. The results showed that the SJR relationship with important scientometrics features.

CONFLICT OF INTEREST: NONE DECLARED.

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