

Improving the Journal Impact Factor Among Nephrology and Urology Journals

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Introduction

The Journal Impact Factor (JIF) is a popular index used to compare a journal's quality among academic journals¹; however, the many relative importance factors that can influence the JIF are unclear. Determination of a particular journal's JIF is calculated by the ratio of total number of citations received in a determined year to the total number of citable articles published by that journal in the previous 2 years (Figure 1)² The objective of this study is to identify factors that can improve or worsen the JIF among nephrology and urology journals.

$$JIF_A \text{ for } YYYYY = \frac{\text{All citations in } YYYYY \text{ to articles published in } A \text{ during } (YYYY-1)+(YYYY-2)}{\text{All citable articles published in } A \text{ during } (YYYY-1)+(YYYY-2)}$$

Figure 1². JIF Calculation formula

Methods

Under the Urology and Nephrology category in the Journal Citations Report (JCR) Website^{5,6}, the top 20 Journals by JIF in 2011 were chosen for the study and three were excluded due to limited content. All manuscripts' abstracts published from 2009-2010 were individually reviewed; each article was categorized based on its research design (Retrospective study, Clinical Trial, Basic science research, Case Report/ Case Series, Cross-sectional study, Review articles, Meta-analysis, Systematic review, Guideline, Non-citable article; i.e. editorial, comment, letter to the editor).

Data values for JIF and number of citations were retrieved from the JCR website. The JCR website did not contain the values for citations made to citable and non-citable articles used to calculate the 2011 JIF. As an alternative, two databases from the Web of Knowledge (WoK) website were used (Web of Science and MEDLINE)^{3,4,7}. A new JIF was calculated using the citations data acquired from the WoK website. The new JIF was correlated with the official JIF published by the JCR through the Spearman's rank-order correlation test. A correlation with a p-value less than 0.05 and a slope close to 1 were defined as the required criteria to grant validation of the data retrieved from JCR.

The association between the variables and JIF was examined using the JIF as the dependent variable. A Welch's t-test and Spearman's rank-order correlation test were performed for categorical and continuous variables respectively. All variables were then included in a multivariate linear regression using a stepwise variable selection method. All computations were performed using SAS 9.3 (SAS Institute, Cary, NC). P-values of <0.05 were considered to be statistically significant. All the assumptions were verified for every test.

Results

The WoK data validation yielded a strong correlation with the data used to calculate the JIF (rho = 0.91, p <.0001, m = 0.96) (Figure 2).

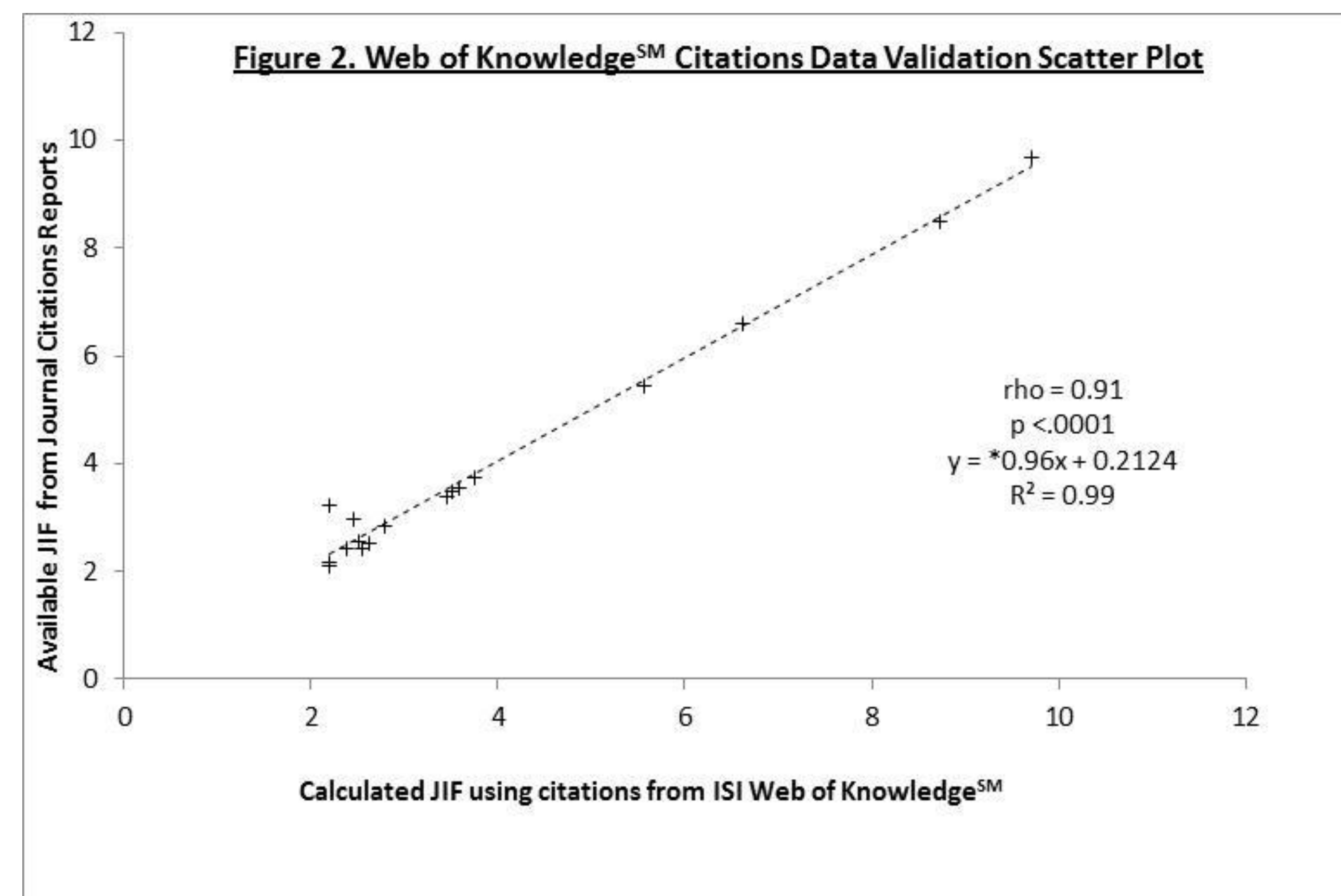


Figure 2. The scattered plot exhibits the correlation between Journal Impact Factor calculated using data retrieved from Web of Knowledge, and Journal Impact Factor calculated with data retrieved from Journal Citation Reports.

A total of 23,012 articles from seventeen journals were evaluated with a median of 1,048 (range= 78 – 6,342) articles per journal. Table 1 summarizes the significant variables from the univariate analysis (Table 1). Table 2 displays the results from the multivariate analysis (Table 2).

Continuous Variable	Total	Median (Range)	Rho (R ²)	p-value
Citations to Citable Articles	36859	2497 (58-4630)	0.73 (0.53)	0.001
Citations to Non-citable Articles	1790	87 (0-234)	0.65 (0.42)	0.0046
Journal Self-Citations	5255	240 (0-1339)	0.57 (0.32)	0.02
Retrospective	2616	54 (14-613)	-0.51 (0.26)	0.03

Table 1. Journals' Summary Statistics and Univariate Analysis Results. Non significant variables: US vs. Non-US Journals, Society vs. Non-society Affiliated Journals, Average Pages Per Issue, Total Publications, US Articles, Non-US Articles, Citable Articles, Non-citable Articles, Clinical Trials, Basic Science Research, Prospective, Case Report/Case Series, Cross-Sectional, Review Articles, Meta-analysis, Systematic Review, Guidelines.

Variable	Estimate	Standard Error	Corrected Estimate (Estimate/ SE)	p-value
Intercept	5.13	0.87	5.90	-
Total Publications	-0.0014	0.00022	-6.36	<.001
Citable Articles	-2.98	1.045	-2.85	0.015
Case Reports/Case Series	-28.03	7.30	-3.84	0.0023
Citations to Citable Articles	0.0015	.00016	9.38	<.001

Table 2. Multivariate Statistics and Analysis Results Model R² = 0.9

Conclusion

Improvement in the JIF among nephrology and urology journals is not only due to increment of citations to citable article, but also the increment of citable to non-citable articles, increment of self-citations, and decrement of retrospective studies, citable articles, and Case Reports/Case Series studies.

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