Correlation Comparison of Journal Quality Indicators with Reference to Library and Information Science Journals

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ABSTRACT

The present study examined the relationship between five major journal quality indicators-Scopus CiteScore, Web of Science Journal Impact Factor (JIF), Google Scholar H5 Index, H5 Median, and Scimago Journal Rank (SJR)-using Library and Information Science (LIS) journals as the sample. The data was collected from Scopus, Web of Science, Google Scholar, and Scimago, and analyzed using descriptive statistics and Spearman's Rank Correlation Coefficient. The results



revealed significant variation across the journal quality indicators, with strong positive correlations between CiteScore and JIF (rho = .911) and between Google Scholar H5 Index and H5 Median (rho = .972). The analysis demonstrated that while these indicators measure different aspects of journal impact, they are closely related in their assessment of journal quality. The findings suggest that relying on multiple journal quality indicators offers a more comprehensive evaluation of journal performance, capturing both citation-based impact and journal prestige. This study emphasizes the value of combining various metrics to guide researchers, librarians, and institutions in selecting and evaluating journals, ensuring a broader understanding of scholarly impact.

Keywords : Journal Metrics, CiteScore, JIF, h5 index, h5 median, Scimago, Correlation

1. Introduction :

The assessment of journal quality is crucial in evaluating the impact and relevance of scholarly publications in any field of research. Over time, several metrics have been developed for measuring the quality of journals. Notable among them are Scopus CiteScore, Web of Science Journal Impact Factor (JIF), Google Scholar H5 Index, Google Scholar H5 Median, and Scimago Journal Rank (SJR). These indicators provide different insights into a journal's citation performance, prestige, and influence. Each metric is calculated using different methodologies, reflecting the diverse approaches of citation databases. This study aims to compare these journal quality indicators, examining the correlations between them to understand how well they align in measuring the scholarly impact of journals. Library and Information Science journals have been chosen for illustration. By analyzing and interpreting these correlations, this study provides valuable insights into the strengths and limitations of each indicator in assessing journal quality.

2. Previous Studies :

Following table provides a summary of some of the studies which compared journal quality indicators and their major findings.

Table 1. Previous Studies on Comparison of Journal Quality Indicators

Authors (Year)	Journal Metrics Compared	Subjects/ Index Covered	Major Findings
Torres-Salinas et al. (2022)	JCI, JIF	Emerging Sources, Arts & Humanities Citation Index (ESCI, AHCI)	Strong correlation between JCI and JIF (0.853). JCI overcomes some limitations of JIF and is a valid alternative.
Orbaya et al. (2021)	JIF, References per Article, Self-citation Rates	Educational Research (EER)	Increase in JIF and number of references per article in EER. Decline in self-citation rates from 2013 to 2018.
Waris et al. (2021)	JIF, ES, SJR, SNIP, CiteScore, Google Scholar H5 Index	Open Access Journals	Significant correlations between JIF and CiteScore (r = 0.690). Using multiple metrics is more reliable for assessing journal quality.
Okagbue & Teixeira da Silva (2020)	CiteScore, JIF	Library and Information Science (LIS)	Strong correlation between CiteScore and JIF (r = 0.787, r s = 0.828). CiteScore is higher than JIF for top LIS journals, showing different citation patterns.
Villaseñor-Almaraz et al. (2019)	IF, SJR, SNIP, ES, CiteScore	Radiology, Nuclear Medicine, and Medical Imaging	Strongest correlation between ES and Total Cites (R S = 0.968). CiteScore and SJR had a notable correlation (R S = 0.911). IF did not have the strongest correlation.
Ahmad, S. (2018)	JIF, SJR, ES, H5 Index	Biochemistry and Molecular Biology	Strong correlations among all four indices. JIF, SJR, ES, and H5 Index provide a comprehensive evaluation of journal quality.
Ahmad et al. (2018)	JIF, ES, SJR, H5 Index	Construction and Building Technology	Strong correlation between JIF and other metrics. JIF is primarily used, but combining SJR, ES, and H5 gives a more comprehensive understanding.
Waris et al. (2017)	JIF, SJR, ES, H5 Index	Sports Science	Strong correlations between JIF and SJR (r = 0.892) and JIF and H5 (r = 0.769). Moderate correlation with ES (r = 0.690).
Ahmad et al. (2017)	JIF, ES, SJR, H5 Index	Mechanical Engineering	Strong positive correlation between JIF and SJR. Suggested using SJR and ES for a more accurate journal quality assessment.
Ahmad et al. (2017)	JIF, ES, SJR, H5 Index	Water Resources	Strong positive correlations between JIF and alternative measures (SJR, ES, H5 Index). Reliable substitutes for JIF in water resources journals.
Ahmad et al. (2017)	JIF, ES, SJR, H5 Index	Environmental Engineering	Strong correlation between JIF, SJR, and H5 Index. Suggested combining JIF, ES, SJR, and H5 for a comprehensive evaluation of journal quality.

3. Methods :

The data for the present study was collected from multiple sources including Scopus Sources, Web of Science, Google Scholar and Scimago Journal Rank website. The list of journals and metrics were collected based on the subject category "Library and Information Science" / Information Science and Library Science. The data from the above sources was consolidated using Microsoft Excel and analysed using Statistical Package for Social Sciences (SPSS) version 21.0. Descriptive statistics were used to understand the pattern of distribution of metrics and Spearman's Rank Correlation co-efficient (rho) to assess the correlation.

Table 2. Journal Quality Indicators and their Calculation Methodology

Journal Quality Indicator	Provider	Calculation Methodology
CiteScore	Elsevier (Scopus)	CiteScore is based on the number of citations to documents (articles, reviews, conference papers, book chapters, and data papers) by a journal over four years, divided by the number of the same document types indexed in Scopus and published in those same four years (Elsevier, 2024).
Journal Impact Factor (JIF)	Clarivate (Web of Science)	The impact factor of a journal is calculated by dividing the number of current year citations to the source items published in that journal during the previous two years (Clarivate, 2024)
h5 Index	Google (Google Scholar)	The h-index of a publication is the largest number h such that at least h articles in that publication were cited at least h times each. Accordingly, h5-index of a publication is the h-index of those of its articles that were published in the last five complete calendar years (Google, 2024).
h5 Median	Google (Google Scholar)	The h-median of a publication is the median of the citation counts in its h-core. The h-core of a publication is a set of top cited h articles from the publication. These are the articles that the h-index is based on. H5 Median is the h-median of only those of its articles that were published in the last five complete calendar years (Google, 2024).
Scimago Journal Rank (SJR)	SCImago	It expresses the average number of weighted citations received in the selected year by the documents published in the selected journal in the three previous years, --i.e. weighted citations received in year X to documents published in the journal in years X-1, X-2 and X-3 (Scimago, 2024).

4. Results and Discussion :

Indexing of Journals

Table 3. Number of LIS Journals Indexed with Quality Indicators in Various Databases

Database and Quality Indicator	Number of Journals
Scopus-indexed Journals with CiteScore	256
Web of Science indexed journals with Journal Impact Factor	132
Google Scholar indexed Journals with H5-index and H5 Median	163
Journals with Scimago Journal Rank	260

5. Descriptive Statistics :

Table 4. Descriptive Statistics of Journal Quality Indicators

Journal Quality Indicator	Minimum	Maximum	Mean	Median	Standard Deviation
Scopus CiteScore	.10	53.10	3.0664	1.50	4.75652
Journal Impact Factor (JIF)	.00	20.10	1.7841	1.05	2.36000
Google Scholar H5 Index	2.00	165.00	23.3926	18.0	22.55266
Google Scholar H5 Median	2.00	298.00	36.8098	26.0	37.73814
Scimago Journal Rank (SJR)	.10	5.78	.4754	0.26	.63737



The descriptive statistics reveal substantial variation in the journal quality indicators for Library and Information Science journals. There is a wide range of values across the five metrics, indicating significant differences in journal performance. The Means of all the metrics are higher than the Medians, suggesting right-skewed distributions where a small number of highly impactful journals are contributing for increase in the averages. The standard deviations are particularly high for all the four citation-based metrics, viz. CiteScore, JIF, H5 Index, and H5 Median, which implies that these metrics capture a broad spectrum of journal performance, from low-impact to highly influential. On the other hand, the journal prestige indicator SJR shows a lower mean, median, and standard deviation, indicating that the distribution in journal prestige is narrower compared to citation-based metrics.

Google Scholar's H5 Index and H5 Median exhibit wider ranges and higher standard deviations. This indicates that Google Scholar captures more variation in journal citation impact than Scopus and Web of Science. Contrastingly, the JIF and CiteScore metrics show moderate values of Means and Medians, implying that they might assess journal quality in a more consistent way. SJR, on the other hand, presents lower overall values and variation, possibly reflecting a more conservative measure of journal influence based on prestige rather than raw citation counts. Overall, the citation-based metrics (CiteScore, JIF, H5 Index, and H5 Median) show more fluctuation and differentiation between journals, while SJR offers a more concentrated view of journal rankings.

6. Correlation :

Table 5. Correlation Comparison between Journal Quality Indicators

Journal Quality Indicator	Scopus CiteScore	Journal Impact Factor	Google Scholar H5 Index	Google Scholar H5 Median	Scimago Journal Rank
Scopus CiteScore		.911	.743	.763	.915
Journal Impact Factor (JIF)			.762	.778	.756
Google Scholar H5 Index				.972	.696
Google Scholar H5 Median					.703

All correlations significant at 0.01 level (2-tailed) with p-value .000

The above table presents the correlation comparison between the various journal quality indicators for Library and Information Science journals reveals several significant relationships. Presumably, the strongest correlation is noted between Google Scholar H5 Index and Google Scholar H5 Median (rho = .972), as both the metrics use the same data. Scopus CiteScore and Journal Impact Factor (JIF) exhibit a very high correlation (rho = .911), suggesting that both are measuring similar aspects of journal impact based on citation counts, although from different databases (Scopus and Web of Science). Both Scopus CiteScore and JIF also show strong correlations with Scimago Journal Rank (SJR), with rho values of .915 and .756, respectively. This indicates that prestige and citation performance are closely related for many journals in Library and Information Science. It may also be observed that the correlations between Google Scholar metrics (H5 Index and H5 Median) and other citation-based indicators, such as CiteScore and JIF, are moderately high (ranging between .743 and .778) while the correlation between SJR and Google Scholar H5 Index (.696) and Google Scholar H5 Median (.703) is lower compared to



the correlations with Scopus and JIF. This shows that SJR's measure of prestige incorporates factors beyond citations alone. However, statistically significant high positive correlations (p-values .000) exist between all the journal quality indicators considered for the study. The variations in indicators may be attributed to the differences in their scope and calculation methods.

7. Conclusion :

The findings from this study show that journal quality indicators like the Journal Impact Factor (JIF), Scopus CiteScore, Google Scholar H5 Index, H5 Median and Scimago Journal Rank (SJR)also provide crucial insights into journal performance. The strong correlations observed between these indicators highlight the complementary nature of these indicators, allowing for a more in-depth understanding of journal quality. The use of multiple indicators ensures a broader and more accurate evaluation, catering to the diverse citation practices across disciplines.

This comprehensive approach can guide researchers, librarians, and institutions in making informed decisions about journal selection and evaluation, ultimately promoting a more holistic understanding of scholarly impact.

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