

COMPARATIVE ANALYSIS OF IMPACT FACTOR, CITE SCORE, AND H-INDEX OF ANATOMY JOURNALS: A BIBLIOMETRIC STUDY

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ABSTRACT

Background: Bibliometric indicators are widely used to assess the scientific influence, visibility, and prestige of academic journals. Among these, Impact Factor, CiteScore, and H-index are the most frequently applied metrics, each capturing distinct dimensions of journal performance. In the field of anatomical sciences, a comparative evaluation of these indicators remains limited. **Objective:** To compare and analyze the correlation between Impact Factor, CiteScore, and H-index of anatomy journals indexed in the Scopus and Web of Science databases. **Materials and Methods:** A descriptive bibliometric analysis was conducted on 17 peer-reviewed anatomy journals indexed in both Scopus and Web of Science. Bibliometric data for the year 2023 were retrieved from publicly available sources. CiteScore values were obtained from Scopus, Impact Factor values from the Web of Science Journal Citation Reports, and H-index values from the SCImago Journal Rank database. Journals were ranked independently for each metric. Spearman's rank correlation coefficient was used to evaluate associations among the indicators, with statistical significance set at $p < 0.05$. **Result:** Fourteen journals with complete datasets were included in the correlation analysis. CiteScore ranged from 0.2 to 7.3, while Impact Factor varied from 0.04 to 4.7. Anatomical Sciences Education ranked highest for both CiteScore and Impact Factor. The H-index ranged from 4 to 135, with Journal of Anatomy demonstrating the highest value, reflecting long-term scholarly influence. Spearman's analysis revealed a strong positive correlation between CiteScore and Impact Factor ($\rho = 0.91, p < 0.001$), and moderate positive correlations between H-index and CiteScore ($\rho = 0.66, p = 0.01$) and between H-index and Impact Factor ($\rho = 0.59, p = 0.03$). **Conclusion:** Impact Factor and CiteScore demonstrate strong concordance in ranking anatomy journals, whereas the H-index reflects cumulative scholarly impact over time. A multidimensional evaluation incorporating multiple bibliometric indicators provides a more comprehensive assessment of journal quality in anatomical sciences.

INTRODUCTION

Bibliometric indicators play a pivotal role in evaluating the scientific impact and visibility of academic journals.^[1,2] These metrics inform decisions made by researchers when selecting target journals, by institutions during research assessment, and by funding agencies in allocating resources. With the expansion of citation databases, several bibliometric indicators have emerged, each employing different methodologies to quantify journal influence. The Journal Impact Factor (JIF), derived from the Web of Science database, measures the average

number of citations received by articles published in a journal during the preceding two years.^[1,3] Although widely used, the Impact Factor has been criticized for its sensitivity to self-citation, emphasis on short citation windows, and disproportionate influence of review articles.

CiteScore, developed by Elsevier and calculated using the Scopus database, addresses some of these limitations by incorporating a four-year citation window and including a broader range of document types.^[1,3] In contrast, the H-index reflects both productivity and citation impact by measuring the number of published articles that have received at

least an equivalent number of citations, thereby emphasizing cumulative scholarly contribution rather than short-term impact.^[1,4]

In addition to Impact Factor, CiteScore, and H-index, other journal-level metrics are frequently referenced in research evaluation. The SCImago Journal Rank (SJR) indicator is a prestige-based metric derived from the Scopus database that assigns weighted citations based on the scientific influence of the citing journals, thereby emphasizing citation quality over quantity. Given these conceptual and methodological differences, discrepancies in journal rankings across metrics are expected.^[4,2] Understanding the degree of alignment among these indicators is particularly relevant in specialized disciplines such as anatomy, where publication volume and citation behavior differ from those in high-output biomedical fields. The present study aims to systematically compare Impact Factor, CiteScore, and H-index in anatomy journals and to evaluate the extent to which these indicators correlate.

MATERIALS AND METHODS

Study Design

This study was conducted as a descriptive bibliometric analysis of anatomy journals. As only publicly accessible bibliometric data were used and no human or animal subjects were involved, ethical approval was not required.

Journal Selection

Seventeen peer-reviewed anatomy journals indexed in both Scopus and Web of Science were included. Journals were selected based on their primary focus on anatomical sciences, including gross anatomy, histology, embryology, and clinical anatomy.

Data Collection

Bibliometric data for the year 2023 were collected from the following sources: - CiteScore: Scopus database - Impact Factor: Web of Science Journal

Citation Reports - H-index: SCImago Journal Rank (SJR) database

Impact Factor data were unavailable for three journals; these journals were excluded from correlation analysis but retained for descriptive reporting.

Statistical Analysis

Journals were ranked independently based on CiteScore, Impact Factor, and H-index. Spearman's rank correlation coefficient (ρ) was used to assess relationships between metrics due to non-normal distribution of values. Correlation strength was interpreted as strong ($\rho \geq 0.7$), moderate ($\rho = 0.3-0.69$), or weak ($\rho < 0.3$). A p-value < 0.05 was considered statistically significant. Statistical analysis was performed using latest SPSS software version 31.

RESULTS

Seventeen anatomy journals were included in the bibliometric assessment, of which fourteen had complete data for all three metrics and were included in inferential analysis.

CiteScore values ranged from 0.2 to 7.3, with Anatomical Sciences Education achieving the highest CiteScore (7.3), followed by Clinical Anatomy (6.5). Impact Factor values ranged from 0.04 to 4.7, with Anatomical Sciences Education again ranking first (4.7). H-index values showed substantial variation, ranging from 4 to 135. Journal of Anatomy demonstrated the highest H-index (135), indicating sustained long-term citation impact. (Table-1)

Spearman's rank correlation analysis demonstrated: - A strong positive correlation between CiteScore and Impact Factor ($\rho = 0.91$, $p < 0.001$) - A moderate positive correlation between H-index and CiteScore ($\rho = 0.66$, $p = 0.01$) - A moderate positive correlation between H-index and Impact Factor ($\rho = 0.59$, $p = 0.03$). [Figure 1,2,3]

Table 1: List of journals and their metrics

SL NO	Name of journal	Citescore	H index	Impact factor
1	Anatomical Sciences Education	7.3	71	4.7
2	Clinical Anatomy	6.5	88	2.3
3	Anatomical record	4.8	99	2.2
4	Journal of Anatomy	4.8	135	2.4
5	Frontiers in Neuroanatomy	4.7	84	2.1
6	Advances in Anatomy Embryology and Cell Biology	2	42	2.518
7	Annals of Anatomy	4.4	62	1.7
8	Anatomical Science International	2.8	45	1.5
9	Surgical and Radiologic Anatomy	2.7	72	1.4
10	Anatomy and Cell Biology	1.8	25	0.932
11	European Journal of Anatomy	0.6	22	0.3
12	Journal of the Anatomical Society of India	0.4	15	0.2
13	National Journal of Clinical Anatomy	0.3	4	0.04
14	Italian Journal of Anatomy and Embryology	0.2	31	0.193
15	Chinese Journal of Anatomy and Clinics	0.3	4	NA
16	International Journal of Anatomy and Research	0.3	3	NA
17	Translational Research in Anatomy	2.9	16	NA

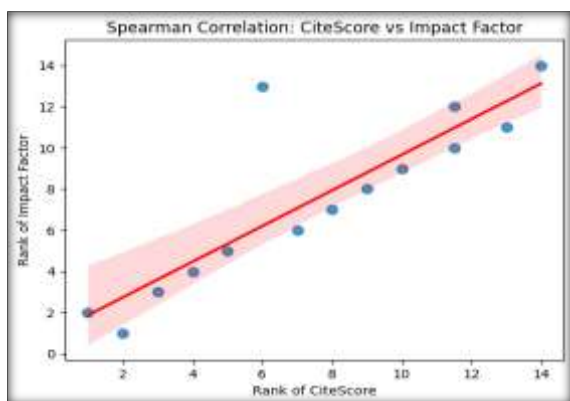


Figure 1: Scatter plot showing Spearman's rank correlation between CiteScore and Impact Factor among anatomy journals ($\rho = 0.91$, $p < 0.001$), demonstrating a strong positive monotonic relationship

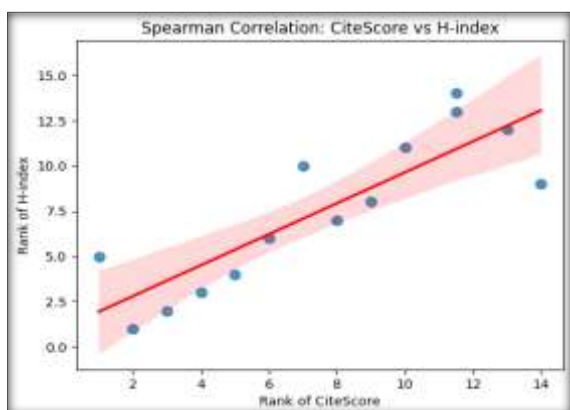


Figure 2: Scatter plot illustrating Spearman's rank correlation between CiteScore and H-index ($\rho = 0.66$, $p = 0.01$), indicating a moderate positive association

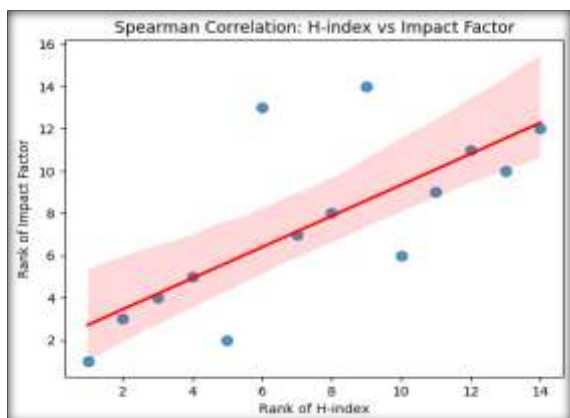


Figure 3: Scatter plot depicting Spearman's rank correlation between H-index and Impact Factor ($\rho = 0.59$, $p = 0.03$), reflecting moderate concordance between long-term and short-term bibliometric indicators

DISCUSSION

The present study demonstrates substantial concordance between CiteScore and Impact Factor in ranking anatomy journals, reflecting their shared reliance on recent citation activity.^[3] Despite differences in citation windows and database

coverage, both metrics emphasize short-term scholarly influence, explaining the strong correlation observed. Similar findings have been reported by Fernandez-Llimos, who highlighted that Journal Impact Factor and CiteScore exhibit comparable ranking behavior across disciplines due to their methodological overlap, despite differences in citation time frames and document inclusion criteria.^[3]

The strong correlation observed in the present study between CiteScore and Impact Factor is also consistent with findings from bibliometric analyses in other biomedical specialties.^[5,6] Villasenor-Almaraz et al., in their evaluation of radiology and medical imaging journals, reported strong correlations between Impact Factor and CiteScore, reinforcing the notion that these metrics are largely interchangeable for assessing recent citation impact across medical disciplines.^[5] Comparable observations were reported by Kianifar et al. in pediatric neurology journals, further supporting the generalizability of these findings beyond anatomical sciences.^[6]

In contrast, the moderate correlations between H-index and the other two indicators observed in the present study underscore the conceptual distinction of the H-index as a cumulative metric. Liu's bibliometric study of family studies journals similarly demonstrated that H-index rankings often diverge from Impact Factor and CiteScore rankings, particularly favoring journals with longer publication histories and sustained citation accumulation.^[4]

This aligns with the present finding that Journal of Anatomy achieved the highest H-index despite not ranking first in short-term citation metrics.

Evidence from discipline-specific bibliometric studies further supports these observations. A bibliometric analysis of articles published in Anatomy, the official journal of the Turkish Society of Anatomy and Clinical Anatomy, revealed that long-term citation accumulation and publication longevity significantly influenced journal visibility and scholarly impact.^[7] These findings corroborate the present study's observation that H-index better reflects sustained academic contribution, particularly in established anatomy journals.

The broader theoretical framework of bibliometric indicators has been extensively discussed by Roldan-Valadez et al., who emphasized that no single metric adequately captures journal quality due to inherent methodological limitations. Their review highlighted that Impact Factor and CiteScore primarily reflect short-term citation dynamics, whereas H-index captures long-term academic influence.^[1] Waltman similarly argued that citation impact indicators should be interpreted cautiously and contextually, advocating for multidimensional evaluation approaches rather than reliance on a single metric.^[2] Falagas et al. further demonstrated that although the SCImago Journal Rank (SJR) indicator and Journal Impact Factor are strongly correlated, they are not interchangeable, as SJR incorporates citation prestige

and network-based weighting rather than raw citation counts alone. This distinction reinforces the need for complementary use of multiple bibliometric indicators when assessing journal influence.^[8]

Studies focusing on regional and specialty journals further highlight the limitations of singular bibliometric assessment. Mehta et al., in their appraisal of Indian dermatology journals, demonstrated that journals with regional focus or emerging publication platforms often exhibit lower citation-based metrics despite maintaining acceptable editorial quality and scientific rigor.^[9] This observation parallels the present study's findings among anatomy journals with lower citation metrics, suggesting that bibliometric performance may be influenced by factors such as indexing coverage, audience size, and publication language rather than intrinsic scientific merit.

Collectively, these findings reinforce the conclusion that bibliometric indicators should be viewed as complementary rather than competitive. While Impact Factor and CiteScore provide insight into recent citation performance, the H-index offers valuable information regarding long-term scholarly influence. Integrating multiple metrics enables a more nuanced and equitable assessment of anatomy journals, supporting informed decision-making by authors, editors, and academic institutions.

CONCLUSION

This bibliometric analysis highlights the complementary nature of Impact Factor, CiteScore, and H-index in evaluating anatomy journals. While Impact Factor and CiteScore exhibit strong agreement and reflect recent citation performance, the H-index captures long-term scholarly influence. A combined, multidimensional evaluation framework provides a more accurate and equitable assessment of journal quality in anatomical sciences

and should be encouraged in academic publishing and research assessment.

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