Poster #67

Diverse journal, article, and author metrics provide an opportunity for innovative interpretation of article impact

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Background

- Research metrics are quantitative tools used to assess the quality, influence, and reach of scientific research outputs
  - These metrics help researchers, institutions, and funding agencies evaluate the impact of scholarly work, but they should be used with careful consideration
- There are three main levels of research metrics[1]

Journal Metrics	Article Metrics	Author Metrics
Assess the influence of academic journals based on citation data and journal reputation	Measure the attention and engagement of individual research articles, including online visibility	Evaluate a researcher's productivity and citation impact over time
EXAMPLES	EXAMPLES	EXAMPLE
Impact Factor (IF), 5-year IF, Eigenfactor, Article Influence Score, CiteScore, Source-Normalized Impact per Paper (SNIP), and SCImago Journal Rankings (SJR)	Altmetric Score and PlumX	*h* index

- While research metrics provide valuable insights, no single metric can fully capture research impact. Each metric offers a unique perspective, and using them in combination allows for a more comprehensive evaluation of scholarly influence
- However, there are challenges with interpreting research metrics
  - Different journals rely on different metrics, making direct comparisons between journals and across metrics difficult
  - The perceived importance of research metrics varies among researchers, audiences, and fields of study. Some scholars prioritize traditional, citation-based metrics, while others emphasize alternative metrics like online engagement and policy impact[2]
- Examining and comparing research metrics across various journals and disease areas can offer deeper insights into how these metrics are used and interpreted, ultimately providing a broader understanding of their role in assessing scientific impact

Objective

To examine the relationship and identify correlations between journal, author, and research metrics across disease states

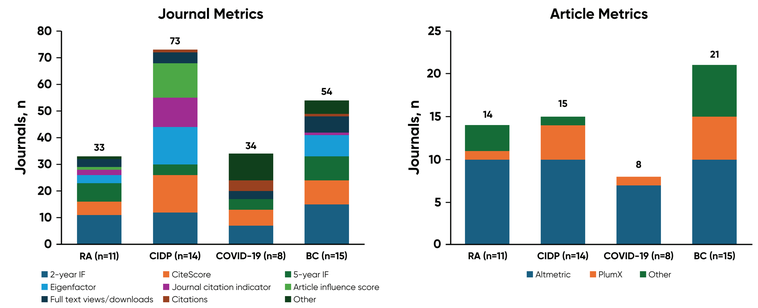
Research Design and Methods

- An Embase search identified the top journals in 2024 for 4 disease states (n=20 each) using the search terms "rheumatoid arthritis," "chronic inflammatory demyelinating polyneuropathy," "coronavirus disease 2019," and "breast cancer"
  - Disease states were selected to represent a broad range, including a common disease, a rare disease, an infectious disease, and a cancer, to highlight differences between fields of study
- Therapy area–specific journals from the top journals were selected for further analysis
- Up to 50 articles from each therapy area–specific journal published in early 2024 were assessed, and all metrics available on journal and article pages were recorded
  - PlumX scores in each category were summed to allow direct comparison between articles
  - Scopus was used to collect the *h* index score for the first author of each article
- The most common journal, article, and author metrics were further assessed for correlations, as well as the impact of publishing OA on metrics
- Data analysis used descriptive statistics to identify trends and relationships in the dataset, correlative statistics to determine correlations between 2 data sets, and Mann–Whitney U tests to determine statistical significance as appropriate

Results

- A total of 72 unique journals were identified between the 4 disease states; after removing journals of broad scope, 48 therapy area–specific journals were selected for further analysis (rheumatoid arthritis [RA], n=11; chronic inflammatory demyelinating polyneuropathy [CIDP], n=14; coronavirus disease 2019 [COVID-19], n=8; and breast cancer [BC], n=15)
  - The number of articles per journal ranged from 2-50 (RA, n=15-50; CIDP, n=2-50; COVID-19, n=50; BC, n=8-50)
- Tables with therapy-specific journals and recorded journal, article, and author metrics for each disease state can be found by scanning the QR code on the right

Figure 1. Which journal and article metrics are available on each journal's website?

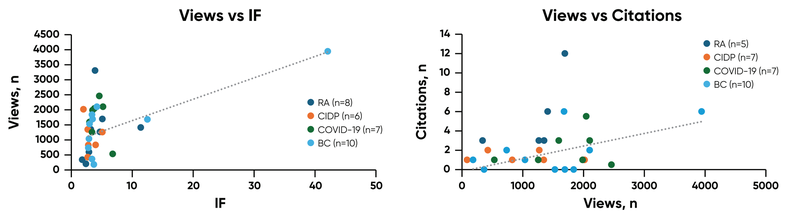


Other journal metrics included circulation, SJR, SNIP, H5-index, JCI, and Altmetric mentions.
Other article metrics included dimensions and Web of Science/CrossRef.
BC, breast cancer; CIDP, chronic inflammatory demyelinating polyneuropathy; COVID-19, coronavirus disease 2019; IF, impact factor; JCI, Journal Citation Indicator; RA, rheumatoid arthritis; SJR, SCImago Journal Rankings; SNIP, Source-Normalized Impact per Paper.

- The most common journal metric available on each journal's website was 2-year IF (n=65), followed by CiteScore (n=52). All journal websites listed more than 1 journal metric
- The most common article metric was Altmetrics (n=50), followed by PlumX (n=14). Some journal websites listed more than 1 article metric

Correlation results for all disease states

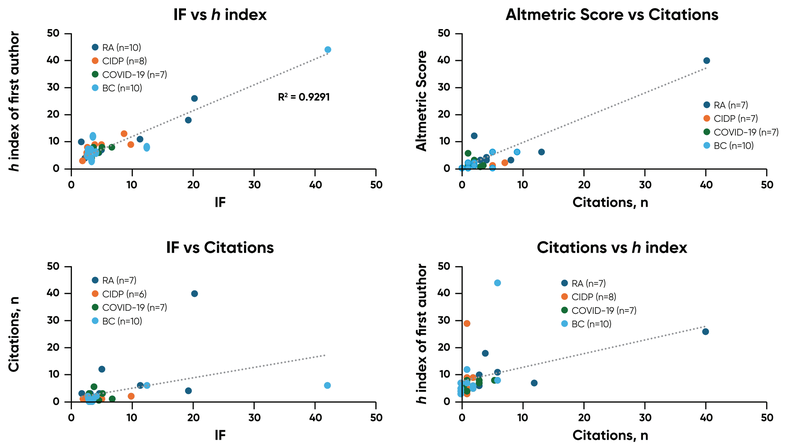
Figure 2. Are views correlated with IF, citations, Altmetric score, or *h* index?



Median values are plotted for each journal. Dashed line indicates trendline for dataset.
BC, breast cancer; CIDP, chronic inflammatory demyelinating polyneuropathy; COVID-19, coronavirus disease 2019; IF, impact factor; RA, rheumatoid arthritis.

- There was a moderate positive correlation between the number of views and IF (correlation=0.55851) and a low positive correlation between views and citations (correlation=0.31428)
- There was no correlation between views and the Altmetric score or *h* index of the first author (correlation<0.3; data not shown)

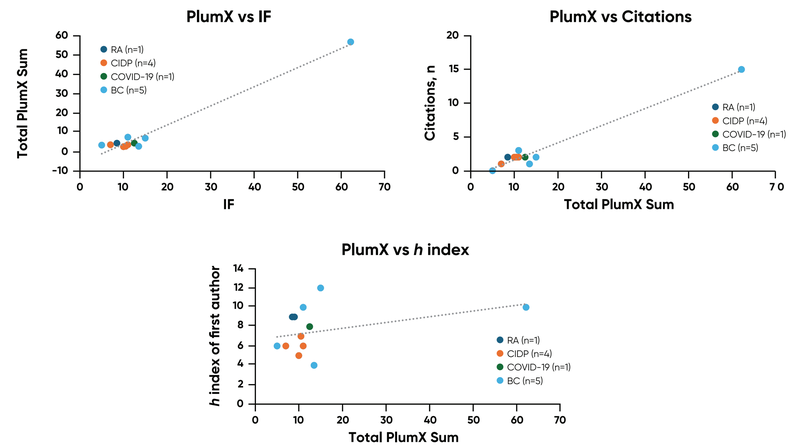
Figure 3. Are there correlations between journal (IF), article (Altmetric score and citations), and author (*h* index) metrics?



Median values are plotted for each journal. Dashed line indicates trendline for dataset.
BC, breast cancer; CIDP, chronic inflammatory demyelinating polyneuropathy; COVID-19, coronavirus disease 2019; IF, impact factor; RA, rheumatoid arthritis.

- There was a very high positive correlation between the IF and *h* index of the first author (correlation=0.94365) and between Altmetric scores and citations (correlation=0.90718)
- There was a low positive correlation between the IF and citations (correlation=0.42814) and between citations and *h* index of first author (correlation=0.41955)
- There was no correlation between the Altmetric score and the IF or *h* index (correlation<0.3; data not shown)

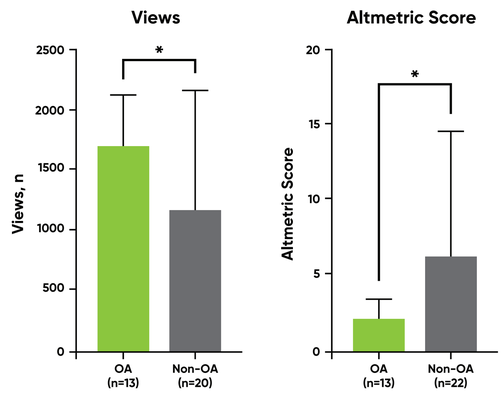
Figure 4. Is there a correlation between total PlumX sum and IF, citations, or *h* index?



Median values are plotted for each journal. Dashed line indicates trendline for dataset.
BC, breast cancer; CIDP, chronic inflammatory demyelinating polyneuropathy; COVID-19, coronavirus disease 2019; IF, impact factor; RA, rheumatoid arthritis.

- There was a very high positive correlation between the total PlumX sum and IF (correlation=0.98547) and between the total PlumX sum and citations (correlation=0.99113)
- There was a low positive correlation between the total PlumX sum and *h* index of the first author (correlation=0.38332)

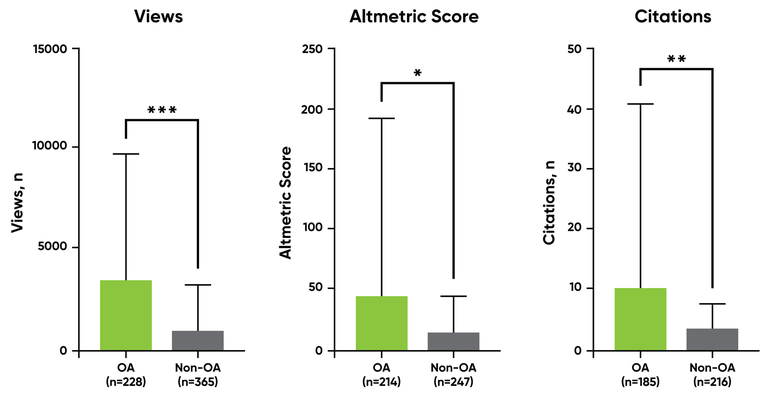
Figure 5a. Is OA associated with higher journal, article, or author metrics in OA vs hybrid journals?



*P<0.05.
OA, open access.

- Views were significantly higher for fully OA vs non-fully OA journals, but Altmetric scores were significantly higher in non-fully OA vs fully OA journals (*P*<0.05 for both)
- IF, citations, *h* index of first author, and total PlumX sums were not significantly different between groups (data not shown)

Figure 5b. Is OA associated with higher journal, article, or author metrics within hybrid journals?



*P=0.0392; **P=0.0026; ***P<0.0001.
OA, open access.

- Views, Altmetric scores, and citations were significantly higher (*P*<0.05 for all) for OA vs non-OA papers in journals that offered both options (**Figure 3**)
- The *h* index of first author and total PlumX sums were not significantly different between groups (data not shown)

Discussion and Conclusions

Which metric is most correlated with higher article views?

- Article readership appears to be most influenced by impact factor (IF) and less by Altmetric score and author prestige. Despite alternative approaches to measuring article impact, traditional journal metrics remain the most predictive of the reach of scientific publications

How do you interpret the differences between the article Altmetric score and PlumX scores?

- Because journals report either Altmetric or PlumX data, direct comparisons between the two are not possible
- In this analysis Altmetric scores were more strongly correlated with higher citations, while the total PlumX sum was correlated with a higher IF, citation numbers, and the *h* index of the first author

How can authors maximize the impact of their scientific work?

- Purchasing open access (OA) when publishing in hybrid journals can help increase article views, Altmetric scores, and citations
- Publishing in higher IF journals or building author credibility can lead to increased article citations

Which metric best describes the impact of scientific work on the community?

- This analysis highlights the importance of evaluating article metrics collectively rather than in isolation. Just as each instrument contributes to the harmony of a symphony, each metric provides a unique perspective on the impact of scientific work. When considered together, these metrics offer a more complete understanding of patterns of engagement with research

How does disease area affect the interpretation of article metrics?

- The relationship between metrics across disease areas is of interest and can be examined in future work

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References

1. Taylor & Francis. Understanding research metrics. 2024. Accessed April, 24, 2025. https://editorresources.taylorandfrancis.com/understanding-research-metrics.
2. Williams K. *Sci Public Policy*. 2022;49(3):518-531.

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