“Let me Google that for you”: search engine page rank as an alternative indicator of article impact compared with other metrics

Ravi P. Subramanian, Cheryl Lucania, William Fazzone, Lisa Gromadzki

Nucleus Global, an Inizio company, Yardley, PA, USA

Presented at: 21st Annual Meeting of ISMPP; May 12-14, 2025; Washington, DC, USA

A copy of this poster can be obtained through this Quick Response (QR) code.

Call to Action

“The impact of search engine optimization needs to be considered in publication planning to ensure appropriate audience engagement”

Objective

- As many patients and healthcare professionals access publications via online search engines (eg, Google),[1-3] we investigated the relationship of Google page ranking compared with commonly used publication metrics

Methods

- A database of ≈500 oncology publications published between April 2014 and September 2024 was developed to capture Journal Citation Reports Impact Factor (JIF), Altmetric Attention Score (AAS), appearance on the first page of Google (G1P), downloads (per journal), and citations (from PubMed)
- Google search terms included “[Drug name]” and “[Drug name] [cancer type]” alone, or “[Drug name] side effects” or “[Drug name] efficacy” and was performed in New Jersey, US from January 4 to January 30, 2025
  - Links located on the first page of Google were defined as G1P
- A subset of this database was reevaluated in the US (Arizona and New Jersey), South Africa, the UK, Switzerland, Australia, and Singapore from April 1 to April 11, 2025

Results

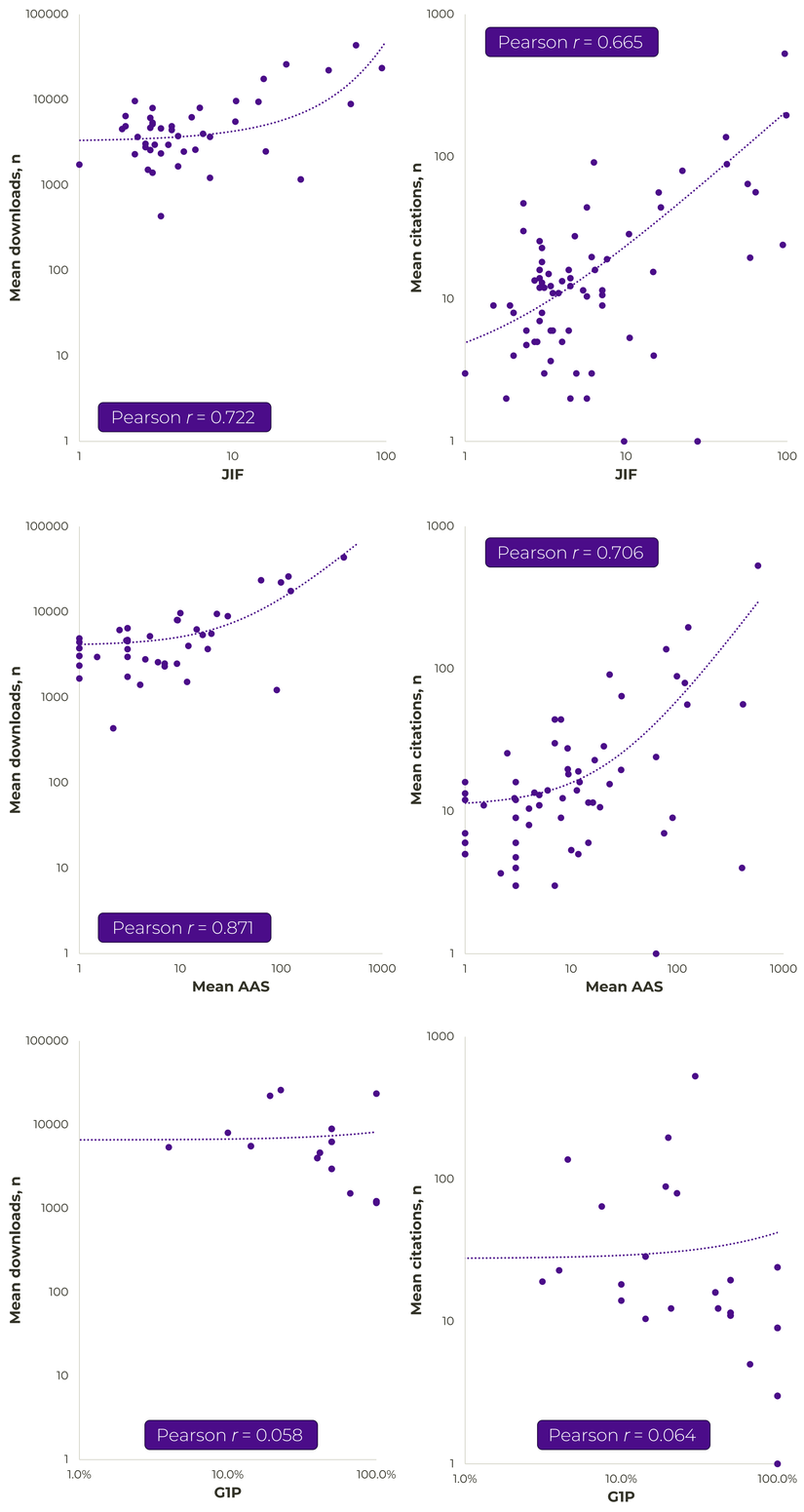
- Among the 491 publications evaluated, several overlaps were identified between JIF, AAS, and G1P and the number of downloads or citations (**Table 1**)

Table 1. Article Characteristics

	Journals, n	Articles, n	JIF, median (range)	AAS, median (range)	No. of downloads, median (range)	No. of citations, median (range)	G1P, %
Overall	70	491	14.8 (1-98.4)	23 (1-1702)	4916 (48-136,739)	24 (1-1998)	12.7%
JIF							
>12	14	248	42.1 (14.7-98.4)	71 (1-1702)	15,721.5 (1166-136,739)	68 (1-1998)	14.5%
>5 to ≤12	15	80	7.6 (5.4-10.5)	9 (1-90)	4548 (1215-18,915)	11.5 (1-91)	14.6%
≤5	41	162	3.4 (1-4.9)	5 (1-281)	3246 (48-31,961)	9 (1-173)	11.0%
AAS							
≥ Median (23)	29	228	41.6 (2.4-98.4)	79 (23-1702)	15,653 (1057-136,739)	68 (1-1998)	16.2%
< Median (23)	53	227	4.8 (1-98.4)	6 (1-22)	3799.5 (48-28,000)	12 (1-173)	8.8%
G1P							
Yes	23	62	25 (2.8-98.4)	41 (1-1702)	5814 (640-69,155)	20.5 (1-1024)	100.0%
No	66	429	10.5 (1-98.4)	20 (1-1050)	4886 (48-136,739)	24 (1-1998)	0.0%

- Articles with an AAS ≥ the median (23) had twice the G1P% as articles with an AAS <23
- While the median number of downloads and citations was lower for articles not appearing G1P, the range was higher
- At the journal level, correlation analysis between JIF, average AAS, and G1P% compared to downloads and citations showed strong positive associations between JIF and average AAS, not G1P% (**Figure 1**)

Figure 1. Journal-Level Analysis of JIF, Mean AAS, or G1P % vs Mean Downloads or Mean Citations



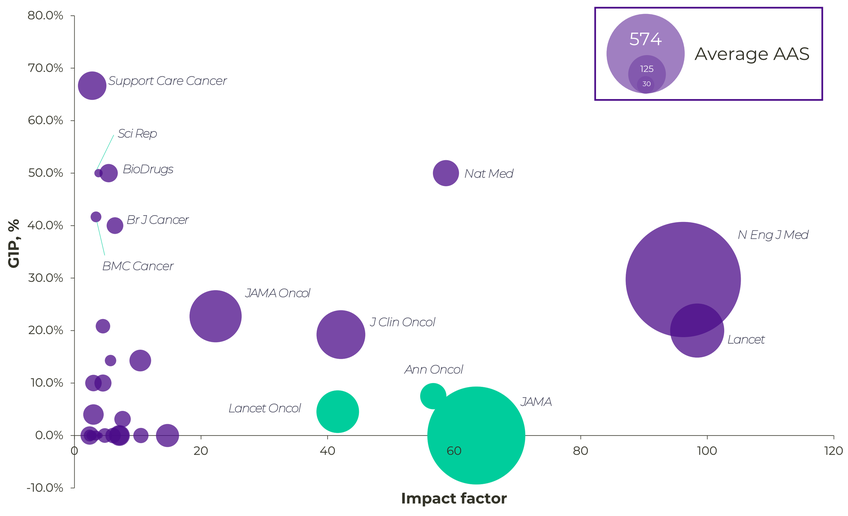
JIF and AAS have similar positive correlation with downloads/citations, while Google page rank (G1P %) does not

Conclusions

- Overall, JIF and AAS are positively correlated with downloads and citations, although outliers exist
- Practical factors (ie, search engine optimization) may play a role in helping audiences to find peer-reviewed publications; however, this does not impact article downloads or citations
  - Some low-IF journals may be more easily found due to prioritization on search engines (eg, Google)
- This preliminary analysis has several limitations, including inability to control for regional/individual-level differences in Google search results, database size, and publication therapeutic area
- Further analysis will see to a broader range of therapeutic areas and journals to understand the effect that search engines may have on audiences finding clinical manuscripts

- While articles published in journals with a JIF of >12 generally had higher AAS, downloads, and citations, there was no difference in G1P % between articles published in journals with a JIF between 5 and 12
- A subset of journals with low JIF, AAS close to or above median, and very high G1P% exists; conversely, a subset of journals with high JIF and AAS and low visibility on Google (low G1P%) also exists (**Figure 2**, teal bubbles)

Figure 2. Relationship of JIF to G1P and Average AAS



JIF may not be the most critical determinant of journal selection

- A subanalysis of 30 publications identified that regional variation may prevent UK publications from appearing G1P in the US (**Table 2**)

Table 2. Regional Differences in Google Page Rank of Journals With ≥2 Articles When Searching “[Treatment] [Cancer]”

Median link position	Articles, n	Treatments	Cancers	AZ	NJ	SA	UK	SUI	SIN	AUS
***Ann Oncol* (UK)**	4	exemestane, niraparib, paclitaxel, ribociclib	breast, ovarian	50	50	50	27	33	46.5	50
***Eur J Cancer* (UK)**	2	eribulin, trebananib	breast, ovarian	49.5	50	39.5	1	25.5	40.5	50
***Future Oncol* (Germany)**	2	alpelisib olaparib, datopotamab deruxtecan	breast, ovarian	16.5	28	27.5	1	20.5	25	28
***Gynecol Oncol* (US)**	4	AVB-500, imiquimod, selinexor, topotecan paclitaxel	cervical, endometrial, ovarian	1.5	1.5	4	1	1	7.5	1.5
***Int J Gynecol Cancer* (UK)**	2	cediranib, olaparib	ovarian	50	50	50	18.5	31	50	50
***JAMA* journals (US)**	2	SB3, trastuzumab	breast	25.5	50	50	2	50	26	50
***Lancet Oncol* (UK)**	6	dalpiciclib, denosumab NKTR-102, ribociclib, trebananib, utidelone	breast, ovarian	3	7	4.5	2	9.5	15	7
***N Engl J Med* (US)**	3	capivasertib dostarlimab, pembrolizumab	breast, endometrial	1	1	1	1	1	1	1
***Support Care Cancer* (Germany)**	2	eribulin, efbemalenograstim alfa	breast	25.5	34.5	26	1.5	25.5	25.5	34.5

- Elsevier journals (teal highlight) underperform on Google (median link position, 12.5 [page 2 of Google]; n=18) vs Springer Nature journals (dark purple highlight; median link position, 5 [G1P]; n=4)
  - These results are supported by the larger dataset (Elsevier G1P = 8.5% [n=236]; Springer Nature G1P = 17.7% [n=85])

References

1. van Riel N, et al. *BJGP Open*. 2017;1(2):bjgpopen17X100833.
2. Schwartz KL, et al. *J Am Board Fam Med*. 2006;19(1):39-45.
3. Bessler JB, et al. *Curr Med Res Op*. 2023;39(9):1271-1277.

Disclosures

RPS, CL, WF, and LG: employees of Nucleus Global, an Inizio company.

Acknowledgments

We thank Tosin Adetunji, Karen Chinchilla, Julie Collins, Sanuji Gajamange, Thato Motlhalamme, Heather Nevola, Andrew Street, and Zhi Yang Loh for research assistance with this poster.

Corresponding author:

Ravi P. Subramanian, PhD, CMPP; ravi.subramanian@nucleusglobal.com

ApotheCom Inizio Medical
Nucleus Global Inizio Medical
Ashfield MedComms Inizio Medical
MEDiSTRAVA Inizio Medical