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Topic Influence on Citations vs. Altmetric Score in Hand Surgery Literature: A Comparative Analysis

Adam Wright-Chisem, Daniel Farivar, Nolan B. Condron, Theodore Brown, David A. Kulber, Stuart Kuschner

Department of Orthopaedic Surgery, Division of Hand Surgery, Cedars-Sinai Medical Center, Los Angeles, United States
Email: theodore.brown@cshs.org

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Abstract

Purpose: Citation counts and journal impact factors have long been favored tools for assessing scholarly influence and informing decisions related to academic promotions and research funding. Despite their ubiquity, these measures often fail to fully capture the extent of a publication's reach. Altmetric scores are an alternative approach focused on online engagement. The lack of studies directly comparing the most-cited articles and the highest Almetric Score articles within the field of hand surgery prevents accurate assessment of the alignment of these key career metrics. **Methods:** We compared the top 50 hand surgery articles by Almetric score vs. the top 50 by citation rate between January 2010, and December 2023. The total number of articles per topic was recorded, and a two-tailed Student's t-tests was performed to determine whether differences in citations versus Altmetric scores were statistically significant ($P < 0.05$). **Results:** Articles in the high-Altmetric group had a mean Altmetric score of 67.14 (ranging from 26 to 220) and an average of 41.96 citations (range: 1 - 169). In contrast, the top-cited articles had a mean Altmetric score of 14.3 (range: 0 - 159) and an average citation count of 204.8 (range: 137 - 655). **Conclusion:** In hand surgery literature, the article topic significantly predicts whether research is more likely to be cited in academic circles or shared online. Patient satisfaction and opioids remain central areas of academic engagement. These findings reinforce the importance of evaluating research impact through multiple lenses, particularly in an era of evolving dissemination platforms.

Keywords

Hand Surgery, Altmetric Score, Citations, Academic Medicine, Orthopaedics

1. Introduction

There is no shortage of resources available for patients and clinicians seeking information about medical conditions and procedures [1]. Social media has emerged as a valuable tool for medical education and research dissemination, not only within the medical community, but also to the lay public [2]. The Altmetric Attention Score allows for the quantification of the impact of research dissemination across social media and online platforms [3]. This quantification is especially relevant in hand surgery, where clinical relevance and public engagement can vary significantly by topic, and thus traditional bibliometrics may not adequately capture the relevance of a publication.

Traditional metrics like citation counts and journal impact factors have long been used to assess scholarly influence and inform decisions related to academic promotions and research funding. Nonetheless, these measures often fall short in capturing the full extent of a publication's reach. Altmetric scores offer an alternative perspective by analyzing online engagements such as mentions in news outlets, blogs, Wikipedia, and social media platforms like X (formerly Twitter), YouTube, and Facebook. The Altmetric score does not include Instagram or TikTok. By quantifying public interest in research, Altmetric scores provide insights into topics that resonate beyond academic audiences.

Recent studies have evaluated the correlation between Almetric score and citation count within the orthopedic literature. When comparing the top-cited hand surgery articles, Yoshimura *et al.* found that mentions on social media were independently correlated with more citations in hand surgery articles [4]. Similarly, Kunze *et al.* found that a higher Almetric score was significantly correlated with higher citation count in articles concerning total joint arthroplasty [5].

On the other hand, Farivar *et al.* found little overlap in lists of the highest cited pediatric spine articles vs those with the highest Altmetric scores [6]. There has not been a study that directly compares the most citated articles and the highest Almetric Score articles within the field of hand surgery. The aim of this study was to compare the top 50 hand surgery articles by Almetric score vs. the top 50 by citation rate. Further, we aimed to identify which subject areas generate attention within academia versus online and to assess the implications for academic visibility, research funding, and public communication.

2. Methods

The Dimensions database (Direct Science, Holtzbrinck Publishing) was used to sort queries based on both citation rates and Altmetric scores. In January 2025, a search was conducted focusing on six specific journals known to encompass the majority of global hand surgery literature and frequently used in prior bibliometric analyses. These journals included: Journal of Hand Surgery (JHS; ISSN: 0363-5023), Journal of Hand Surgery (European Volume) [JHS (Euro); ISSN: 1753-1934], Journal of Hand Surgery: Asian-Pacific Volume (JHS (Asian-Pacific); ISSN: 2424-8363), Journal of Plastic Surgery and Hand Surgery (J Plast Surg Hand

Surg; ISSN: 2000-656X), Techniques in Hand and Upper Extremity Surgery (Tech Hand Up Extrem Surg; ISSN: 1089-3393), and HAND (ISSN: 1558-9447). The inclusion period was limited to articles published between January 1, 2010, and December 31, 2023. While the Altmetric score system was introduced in 2012, it is capable of capturing earlier online dissemination of scientific articles via the Internet and social media platforms. Articles from 2024 were excluded as they had not accrued sufficient time for a stable Altmetric score to develop.

After identifying the top 50 articles for each group, additional analysis using the Dimensions database was performed to obtain yearly citation counts. Within the database, citations are defined as references made by other scholarly outputs, including research articles, books, monographs, chapters, preprints, and conference proceedings. The article list was then transferred to the Altmetrics Explorer platform, where annual Altmetric score data were collected and categorized by domain. Online attention was further examined across various platforms, including mainstream news, blogs, policy documents, patents, X, Weibo, Facebook, LinkedIn, Reddit, Pinterest, and F1000.

Articles were categorized by primary topic, and for each topic, average citation count and Altmetric score were calculated. The topics included: nerve, trauma, surgical training, conservative management, arthritis, opioid use, patient satisfaction, healthcare cost, congenital differences, prosthetics, infection, non-union, and pain.

The dataset was compiled from journal databases and institutional repositories, selecting peer-reviewed articles primarily related to hand and upper extremity surgery. Each article was manually reviewed to determine its dominant topic. If multiple topics were addressed, the primary theme was selected based on title and abstract review. Topic coding was done independently by two researchers, with disagreements resolved through consensus discussion. Data cleaning was conducted to remove duplicate entries and standardize publication metadata.

Altmetric scores were obtained using the Altmetric Explorer platform, while citation data were gathered from Dimensions and Google Scholar. The total number of articles per topic was recorded, and statistical analysis was performed using two-tailed student's t-tests to determine whether differences in citations versus Altmetric scores were statistically significant. A threshold of $P < 0.05$ was considered significant. Topics with fewer than two total articles were excluded from statistical comparison.

3. Results

Table 1 displays the top 50 articles ranked by Altmetric score and citation count. Among the 100 articles evaluated, only 5 articles (5%) appeared in both groups. Articles in the high Altmetric group had a mean Altmetric score of 67.14 (ranging from 26 to 220) and an average of 41.96 citations (range: 1 - 169). In contrast, the top-cited articles had a mean Altmetric score of 14.3 (range: 0 - 159) and an average citation count of 204.8 (range: 137 - 655). When analyzing article themes,

those focusing on infection (10% vs. 0%, P = 0.004) and scaphoid nonunion (6% vs. 0%, P = 0.021) were significantly more prevalent in the Altmetric group. Meanwhile, topics related to patient satisfaction (26% vs. 12%, P = 0.003) and opioids (6% vs. 0%, P = 0.003) were significantly more common in the top-cited group. The total counts of citations and online mentions for both sets are summarized in Table 2. X was the dominant platform, accounting for approximately 68% of all online mentions, comprising 71% in the Altmetric group and 48% in the citation-based group.

Table 1. Distribution of article topics among the 50 most-cited and 50 highest-altmetric hand surgery articles.

Topic	No. articles in top 50 Citations rate articles (%)	No. of articles in top 50 Almetric score articles (%)	P-Value
Patient Satisfaction	13 (26%)	6 (12%)	**0.0038346**
Nerve	10 (20%)	16 (32%)	0.33732484
Scaphoid non-union	0 (0%)	3 (6%)	**0.02646509**
Surgical training	7 (14%)	9 (18%)	0.87963716
Trauma	7 (14%)	12 (24%)	0.30733566
Conservative management	6 (12%)	5 (10%)	0.37235024
arthritis	3 (6%)	3 (6%)	0.73205619
Opioid	3 (6%)	0 (0%)	**0.00686066**
Pain	3 (6%)	1 (2%)	0.08900566
healthcare cost	2 (4%)	2 (4%)	0.77981388
Congeital	1 (2%)	3 (6%)	0.25364397
Infection	0 (0%)	5 (10%)	**0.00416841**
Prosthesis	0 (0%)	2 (4%)	0.06997605

Table 2. Citation counts and online attention sources for the 50 most-cited and 50 highest-altmetric hand surgery articles.

	Citations	Almetrics
Online Mentions	230	1472
Twitter (X)	110	1047
Facebook	13	44
News	47	307
Policy	9	4
Google+	0	1
Blog	5	22

Continued

Wiki	14	27
Video	1	5
Patent	25	4
Reddit	0	2
Bluesky	0	6
Other	8	1

4. Discussion

The role of social media and networking websites is evolving as a tool for education and research dissemination [7] [8]. For this reason, it is important to determine what drives both clinicians and patients to online content. We found that articles on the topics of patient satisfaction (26% vs. 12%) and opioids (6% vs. 0%) appeared more frequently in the top citations group than in the top Almetric group. Surprisingly, these topics, at least in the manner that they are presented in the literature, may be considered more relevant within the medical community than they are to the lay public. This is perhaps because topics like patient satisfaction are expressed and quantified in the literature in ways that can be difficult to interpret for the lay public. For example, an article titled Accuracy and Reliability of the Mayo Elbow Performance Score is highly cited because it has direct implications for the way that researchers will collect and interpret outcome data in future studies [9]. On the other hand, lay audiences may care more about topics such as the treatment techniques available for elbow conditions rather than the psychometric properties of surveys used to assess the outcomes of those techniques.

The finding of lower online engagement vs higher citation count for opioid-themed articles is surprising given the well-documented public discourse on the opioid epidemic. In one study of patient's perceptions regarding opioid prescribing policies in an orthopedic hand surgery practice, the authors found that 98% of patients indicated that they would like more education on opioids and their doctors' prescribing practices [10]. Clearly, patients find the topic of opioid prescribing important and will express that when prompted (such as by a survey in the above study) but may not independently seek out such information.

The two article themes that appeared more frequently in the Almetric group than the citation group were infection (10% vs. 0%) and scaphoid nonunion (6% vs. 0%). These findings are counterintuitive, as most in the field would consider these topics to be academically and clinically relevant, but of low overall importance to the public given their relatively low incidence as clinical entities. Literature estimates of the incidence of scaphoid fractures range from 2% - 7% of all fractures with subsequent nonunion occurring in 2% - 5% of these injuries [11] [12]. The incidence of infection following hand surgery is also low, with estimates around 1% for elective cases and between 5% - 10% for traumatic cases [13] [14]. We hypothesize that these topics appear to generate more online "buzz" due to

the fear factor associated with rare but debilitating complications. Both are challenging to treat and can lead to prolonged pain, dysfunction, and disability. It is therefore not surprising that patients will have a sense of anxiety about these topics and turn to online resources to seek more information about the subject of their anxieties. Surgeons should be aware of this and provide appropriate education and counseling to address these fears.

Taken together, these findings should remind surgeons that there are discrepancies between what we find relevant and what our patients and the general public perceive to be important topics in the field of hand surgery. Further, surgeons must be alert to the fact that their patients will go online to seek out information. This should not be viewed in a negative light, as is sometimes expressed amongst healthcare professionals with tropes such as "Please do not confuse your Google search with my medical degree." Rather, this should be viewed as an opportunity to collaborate with our patients and direct them toward high quality online resources, which are now more available than ever thanks to the dissemination of research on platforms such as X. Patients who demonstrate higher levels of engagement in their care have been shown to have improved health outcomes [15].

5. Limitations

This analysis is limited by its retrospective design and reliance on Altmetric scores which can be influenced by transient media coverage, promotion strategies, or automated activity, potentially skewing public interest indicators. Additionally, language barriers, regional differences, and publication access (e.g., open access vs. paywalled articles) may influence both citation and Altmetric behavior, which were not explored in this analysis. A high Almetric score does not necessarily correlate to quality, usefulness or intent of article, and does not offer any insight into the reason it is being disseminated online [16].

6. Conclusion

In hand surgery literature, article topic significantly predicts whether research is more likely to be cited in academic circles or shared online. Counterintuitively, infection and scaphoid non-union stood out as topics with higher Altmetric attention relative to citations, indicating greater resonance with online audiences. Patient satisfaction and opioids remain central areas of academic engagement. Surgeons must be aware of the trends in public dissemination of hand surgery topics via internet resources so as to work with their patients most effectively. From an academic perspective, these findings reinforce the importance of evaluating research impact through multiple lenses, particularly in an era of evolving dissemination platforms. Institutions and academic bodies should consider adopting different metrics when evaluating scholarship and promoting faculty.

Author Contributions

Conceptualization, AWC, DF, and NC; methodology, AWC.; software, AWC.; vali-

dation, AWC., DF., and SK.; formal analysis, AWC, TB.; data curation, AWC, DF.; writing—original draft preparation, AWC, DF, NC.; writing—review and editing, TB, AWC.; supervision, SK.; project administration, TB; funding acquisition, SK. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Anderson, A.S. and Klemm, P. (2008) The Internet: Friend or Foe When Providing Patient Education? *Clinical Journal of Oncology Nursing*, **12**, 55-63. https://doi.org/10.1188/08.cjon.55-63

[2] Hariton, E. and Locascio, J.J. (2018) Randomised Controlled Trials—The Gold Standard for Effectiveness Research: Study Design: Randomised Controlled Trials. *BJOG: An International Journal of Obstetrics & Gynaecology*, **125**, 1716-1716. https://doi.org/10.1111/1471-0528.15199

[3] Bellam, K., Yakkanti, R., Amaya, A., Qiu, M.F., Conte, B. and Aiyer, A. (2023) Orthopedic Surgery Residencies: The Leap to Social Media. *Orthopedics*, **46**, e281-e286. https://doi.org/10.3928/01477447-20230310-07

[4] Laccourreye, O. (2021) Altmetrics: What Exactly Is That? *European Annals of Otorhinolaryngology, Head and Neck Diseases*, **138**, Article No. 67. https://doi.org/10.1016/j.anorl.2020.05.002

[5] Yoshimura, R., Grant, M.C., Gardiner, M.D. and Wade, R.G. (2021) Disseminating Hand Surgery Research Using Social Media: The Relationship between Altmetrics and Citations. *The Journal of Hand Surgery*, **46**, 740-747. https://doi.org/10.1016/j.jhsa.2021.03.028

[6] Farivar, D., Illingworth, K.D., Lin, A.J., Nigh, E.D., Finkel, R. and Skaggs, D.L. (2024) Subject Matter Predicts Where Top Pediatric Spine Articles Are Shared: Citations vs. Social Media. *Journal of Pediatric Orthopaedics B*, **33**, 280-282. https://doi.org/10.1097/bpb.0000000000001132

[7] Kunze, K.N., Vadhera, A.S., Polce, E.M., Higuera, C.A., Siddiqi, A., Chahla, J., *et al.* (2023) The Altmetric Attention Score Is Associated with Citation Rates and May Reflect Academic Impact in the Total Joint Arthroplasty Literature. *HSS Journal®: The Musculoskeletal Journal of Hospital for Special Surgery*, **19**, 37-43. https://doi.org/10.1177/15563316221115723

[8] Sotto-Santiago, S., Sharp, S. and Mac, J. (2020) The Power of Social Media in the Promotion and Tenure of Clinician Educators. *MedEdPORTAL*, **16**, Article No. 10943. https://doi.org/10.15766/mep_2374-8265.10943

[9] Cusick, M.C., Bonnaig, N.S., Azar, F.M., Mauck, B.M., Smith, R.A. and Throckmorton, T.W. (2014) Accuracy and Reliability of the Mayo Elbow Performance Score. *The Journal of Hand Surgery*, **39**, 1146-1150. https://doi.org/10.1016/j.jhsa.2014.01.041

[10] National Guideline Centre (UK) (2022) Evidence Review: Withdrawal Symptoms: Medicines Associated with Dependence or Withdrawal Symptoms: Safe Prescribing and Withdrawal Management for Adults: Evidence Review D. NICE Guideline, No. 215. National Institute for Health and Care Excellence (NICE).

[11] Hove, L.M. (1999) Epidemiology of Scaphoid Fractures in Bergen, Norway. *Scandi-*

navian Journal of Plastic and Reconstructive Surgery and Hand Surgery, **33**, 423-426. https://doi.org/10.1080/02844319950159145

[12] Jørgsholm, P., Ossowski, D., Thomsen, N. and Björkman, A. (2020) Epidemiology of Scaphoid Fractures and Non-Unions: A Systematic Review. *Handchirurgie Mikrochirurgie Plastische Chirurgie*, **52**, 374-381. https://doi.org/10.1055/a-1250-8190

[13] Gundlach, B.K., Sasor, S.E. and Chung, K.C. (2020) Hand Infections: Epidemiology and Public Health Burden. *Hand Clinics*, **36**, 275-283. https://doi.org/10.1016/j.hcl.2020.03.001

[14] Wormald, J.C., Baldwin, A.J., Nadama, H., Shaw, A., Wade, R.G., Prieto-Alhambra, D., *et al.* (2023) Surgical Site Infection Following Surgery for Hand Trauma: A Systematic Review and Meta-Analysis. *Journal of Hand Surgery* (*European Volume*), **48**, 998-1005. https://doi.org/10.1177/17531934231193336

[15] Li, Y., Guo, Y., Hong, Y.A., Zeng, Y., Monroe-Wise, A., Zeng, C., *et al.* (2022) Dose-Response Effects of Patient Engagement on Health Outcomes in an mHealth Intervention: Secondary Analysis of a Randomized Controlled Trial. *JMIR mHealth and uHealth*, **10**, e25586. https://doi.org/10.2196/25586

[16] Zhang, D. and Earp, B.E. (2022) The Usefulness of Instagram Posts Tagging Hand Surgery Conditions. *Journal of Hand and Microsurgery*, **14**, 304-307. https://doi.org/10.1055/s-0040-1721171