

Open Access Publication in Total Knee Arthroplasty is Associated with Increased Social Media Attention, but is not Associated with Increased Citations

Robert John Cueto¹, Andrew Harris, Kevin T Root, Eric James Panther, Samir Sabharwal, Micheal Raad, Vishal Hegde, Julius Kunle Oni

¹University of Florida

INTRODUCTION:

Publication in journals that offer open access (OA) readership is becoming increasingly popular in total joint arthroplasty research. While OA full-text manuscripts are free for readers to view, OA publication is often paid for by authors. Given more journals are offering OA publication, investigation is needed to study the impact of OA publication on readership and the potential to influence future research. The purpose of this study was to compare social media attention and citation rates between OA and non-OA publications in total knee arthroplasty (TKA) literature.

METHODS: Peer-reviewed TKA journal articles were identified from 2016-2022 using the Altmetric Explorer Database. We analyzed the Altmetric Attention Score, which is a weighted count of social media attention found for an individual research output (including Twitter, Facebook, Reddit, and Google+), and the Mendeley Readership Score. Articles were grouped based on whether they were published as OA or non-OA. Subgroup analysis of studies published only in top-10 journals, as determined by h5-index, was also performed. Negative binomial regression was used to analyze visibility parameters and number of citations while adjusting for days since publication with 95% confidence intervals reported. Using independent *t*-tests, the means of measured scores were compared between OA vs. non-OA groups.

RESULTS: 9,606 publications were included, 4,669 (48.61%) were open access. Of the articles that had at least 1 mention in each respective social media source, mean Twitter mentions and Facebook mentions were 11.57 ± 60.77 (7,790 articles [81.09%]) and 1.95 ± 4.60 (1,603 articles [16.68%]) respectively. Mean Altmetric Attention Score was higher for OA articles (13.45 [10.84, 16.05] vs. 8.42 [7.43, 9.43], $P = 0.01$); mean Mendeley Readership Score was also higher for OA articles (43.91 [42.28, 45.53] vs. 36.72 [35.45, 37.99], $P < 0.01$). OA status was not a significant independent predictor of number of citations (13.97 [13.16, 14.75] vs. 13.62 [12.82, 14.44], $P = 0.91$). Subgroup analysis of only studies published in top-10 journals showed OA status was not an independent predictor of Altmetric Attention Score or number of citations (13.46 [8.95, 17.97] vs. 9.48 [7.92, 11.03], $P = 0.08$) and (19.45 [17.43, 21.47] vs. 18.63 [17.35, 19.91], $P = 0.50$) respectively, but was an independent predictor of Mendeley Readership (48.90 [45.12, 52.63] vs. 40.18 [38.53, 41.83], $P < 0.01$) (Table 1).

DISCUSSION AND CONCLUSION: OA publication in TKA literature is associated with increased social media attention, but not associated with increased overall citations. This association, however, was not observed among the top 10 arthroplasty journals. Authors may utilize these results to weigh the relative importance of readership, citations, and online engagement to the cost of the OA publication.

TABLE 1. Comparison of citation rates and visibility parameters between articles published with and without open access

Metric	Open Access	Non-Open Access	P*
All Articles	(N = 4,669)	(N = 4,937)	
Dimensions Citations (mean ± SD)	13.97 ± 28.26	13.63 ± 29.02	0.91
Mendeley Readers (mean ± SD)	43.91 ± 56.57	36.72 ± 45.39	< 0.01
Altmetric Attention Score (mean ± SD)	13.45 ± 90.71	8.42 ± 36.14	0.01
Articles Published in Top 10 Journals	(N = 874) 18.72%	(N = 2,215) 44.87%	
Dimensions Citations (mean ± SD)	19.45 ± 17.43	18.63 ± 31.05	0.50
Mendeley Readers (mean ± SD)	48.90 ± 45.18	40.18 ± 39.97	< 0.01
Altmetric Attention Score (mean ± SD)	13.46 ± 59.71	9.48 ± 37.71	0.08

SD, standard deviation.

*P - value calculated using negative binomial regression.

Bold values indicate statistical significance.