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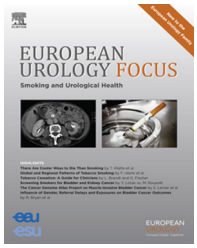

Education

Introducing the Twitter Impact Factor: An Objective Measure of Urology's Academic Impact on Twitter

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Article info

Article history:
Accepted March 14, 2016

Associate Editor:
James Catto

Keywords:
Social media
Impact factor
Twitter
Urology

Abstract

Background: Social media use in academia and urology is rising. Specifically, individual journals now have Twitter accounts (Twitter Inc, San Francisco, CA, USA) and regularly tweet academic content.
Objective: To present and evaluate the Twitter impact factor (TIF), a novel means of measuring a journal's academic influence in the realm of social media.
Design, setting, and participants: Journal Citation Reports (JCR; Thomson Reuters, New York, NY, USA) for 2014 was queried for urologic academic journals. English-language journals with active Twitter accounts since 2013 were included. The total number of followers, tweets, and retweets over a 2-yr period were collected.
Outcome measures and statistical analysis: Each journal's TIF was calculated based on the number of retweets per original relevant tweet. Comparisons between the TIF and the journal impact factor (JIF) as well as the Klout score were made using the Pearson correlation.
Results and limitations: Of 33 journals listed in the JCR for 2014, 7 (21%) had a Twitter presence as of 2013. The number of JCR-listed journals with a Twitter handle increased by 29% in 2014. There was an increase in the mean number of relevant tweets per journal during the study period and a 130% increase in the number of retweets over 1 yr. *European Urology* (1.80) and *BJU International* (1.46) had the highest TIFs. The journals with the highest number of Twitter followers were *European Urology* (5807) and the *Journal of Urology* (4402). The journals with the highest numbers of relevant tweets were *European Urology* (1159) and *BJU International* (1090). There was a positive but statistically insignificant association between the TIF and the JIF ($r = 0.64$, $p = 0.12$). There was a strongly positive linear correlation between the TIF and the Klout score ($r = 0.84$, $p = 0.0086$).
Conclusions: With the increasing use of social media by individuals and academic journals, the TIF can be a useful tool to measure the academic reach and impact of a journal on Twitter.
Patient summary: Social media is an increasing part of the way in which practitioners and academicians communicate. The TIF can be used to analyze the impact of journal Twitter feeds and their social media content.

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http://dx.doi.org/10.1016/j.euf.2016.03.006
2405-4569/Published by Elsevier B.V. on behalf of European Association of Urology.

1. Introduction

Social media use in academic medicine has been growing as the medical field and medical professionals strive to adapt to current modes of communication and interaction. The term *social media* describes Web-based applications that allow people to create and exchange content. It generally involves media designed to disseminate content through social interaction with easy-to-use publishing platforms [1]. Content is generated and shared in real time with users interacting through computers and mobile devices [2]. Twitter (Twitter Inc, San Francisco, CA, USA) is a social media network through which subscribers can share ideas in ≤140 characters, with the ability to attach photos and links to other Web content. Traditionally used by individuals and businesses, it is the most widely used microblogging platform, with 218 million monthly active users and an average of 500 million *tweets* each day [3]. Twitter allows rapid and expansive diffusion of information within seconds of posting a tweet. A feature that allows this is the ability for one account to *retweet* a post on Twitter from another user, amplifying the audience of a tweet by sharing it with the followers of that second Twitter account.

Twitter has recently been adopted by medical professionals and other academic users as a means of communicating and promoting discussion. Urology as a subspecialty has embraced the use of this social media outlet relatively quickly and robustly. Twitter use by individual urologists, urologic societies, and journals has been expanding rapidly over the past few years. As such, there has been increasing literature regarding its popularity and utility and even guidelines for use in an academic context [1,4,5].

Academic journals have created Twitter accounts and are now regularly tweeting about individual journal articles. It has been shown in other medical specialties that Twitter activity can predict which articles are likely to be highly cited within the first 3 d of article publication [6]. Although there is not currently a tool to measure a journal's academic impact via Twitter, a variety of tools exist to measure the impact of conventional print journals, for example, the journal impact factor (JIF).

We propose measuring a journal's academic impact on Twitter as the *Twitter impact factor* (TIF), which includes the reach of the journal's original, academically relevant tweets based on the number of retweets for each tweet (analogous to citations). The ability to evaluate the reach of a journal's output in real time would be an alternative to the current JIF.

2. Materials and methods

Journal Citation Reports (JCR; Thomson Reuters, New York, NY, USA) for 2014 was queried for urologic academic journals. A search on Twitter yielded urologic academic journals listed in the JCR with a Twitter handle. English-language journals with active Twitter accounts since 2013 were included. The total numbers of followers, tweets, and retweets over a 2-yr period (2013–2014) were collected. Tweets were evaluated for relevance, and only original tweets were included. Tweets were considered relevant for this study if they linked directly to an article published in that journal or contained academic and urology-related content. Content that was nonacademic, such as meeting announcements, or responses or retweets sent to the account were not included. The number of retweets of each journal's relevant tweets was collected by year.

The JIF and the Klout score (Klout Inc, San Francisco, CA, USA) for each journal with a Twitter account was also collected. The JIF is a marker of how frequently the articles in a journal are cited over a 2-yr period. The JIF for the year 2013 was used for statistical comparisons. The Klout score is an indicator of social media influence. It evaluates the size of a user's social media network and measures how other users interact with the content created by an account [3]. The Klout score ranges from 1 to 100, with a higher score indicating greater influence.

The journal's TIF was calculated based on the number of retweets per original relevant tweet. This is similar to a JIF in that retweets are comparable to citations and the original tweet parallels a journal article. Journals that did not have Twitter accounts for at least 2 yr were excluded from the TIF analysis so that TIF scores would be calculated in a fashion similar to the JIF.

The Pearson correlation coefficient was calculated using R v3 (R Foundation, Vienna, Austria) to analyze the relationship between a journal's traditional JIF and the TIF and to compare the Klout score with the TIF. A p value of <0.05 was considered statistically significant.

3. Results

A total of 33 journals listed by JCR in 2014 had a primary focus on urology. Of these, seven journals (21%) had active Twitter accounts as of 2013. The number of JCR-listed journals with Twitter handles increased to nine in 2014, a 29% increase over 1 yr. The mean number of followers for the seven urologic journals as of February 2015 was 2780 (standard deviation [SD]: 2159), with *European Urology* (5807), the *Journal of Urology* (4402), and *BJU International* (4383) having the most followers (Table 1).

Table 1 – Twitter metrics for the seven English-language urology journals with active Twitter accounts since 2013

Journal	Twitter handle	No. of followers	2013 and 2014			TIF	JIF 2013	Klout score
			Total tweets	Relevant tweets	Retweets			
BJU International	@BJUIjournal	4383	2442	1090	1595	1.46	3.13	55
Canadian Journal of Urology	@canjurol	991	29	20	21	1.05	0.91	28
Current Opinion in Urology	@CO_Urology	122	638	240	4	0.017	2.12	18
European Urology	@EUplatinum	5807	2488	1159	2087	1.80	12.5	56
Journal of Endourology	@JEndourology	953	515	246	223	0.91	2.10	39
Journal of Urology	@JUrology	4402	595	451	442	0.98	3.75	47
Nature Reviews Urology	@NatRevUrol	2799	1986	472	438	0.93	4.52	49

JIF = journal impact factor; TIF = Twitter impact factor.

Please cite this article in press as: Cardona-Grau D, et al. Introducing the Twitter Impact Factor: An Objective Measure of Urology's Academic Impact on Twitter. Eur Urol Focus (2016), http://dx.doi.org/10.1016/j.euf.2016.03.006