ORIGINAL ARTICLE HEALTH SERVICES RESEARCH AND POLICY

Social Media and Peer-Reviewed Medical Journal Readership: A Randomized Prospective Controlled Trial

SA-CME

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Abstract

Objective: To prospectively evaluate the impact of increasing levels of social media engagement on page visits and web-link clicks for content published in the *Journal of the American College of Radiology*.

Methods: A three-arm prospective trial was designed using a control group, a basic Twitter intervention group (using only the Journal's @JACRJournal Twitter account), and an enhanced Twitter intervention group (using the personal Twitter accounts of editorial board members and trainees). Overall, 428 articles published between June 2013 and July 2015 were randomly assigned to the three groups. Article-specific tweets for both intervention arms were sent between September 14, 2015, and October 28, 2015. Primary end points included article-specific weekly and monthly page visits on the journal's Elsevier website (Amsterdam, Netherlands). For the two intervention groups, additional end points included 7-day and 30-day Twitter link clicks.

Results: Weekly page visits for the enhanced Twitter arm (mean 18.2; 95% confidence interval [CI] 15.6-20.7) were significantly higher when compared with the weekly page visits for the control arm (mean 7.6; 95% CI 1.7-13.6). However, there was no demonstrable increase in weekly page visits (mean 9.4; 95% CI 7.4-11.5) for the basic Twitter arm compared with the control arm. No intervention effects over control, regardless of Twitter arm assignment, were demonstrated for monthly page visits. The enhanced Twitter intervention resulted in a statistically significant increase in both 7-day and 30-day Twitter link clicks compared with the basic Twitter intervention group.

Conclusions: An organized social media strategy, with focused social media activity from editorial board members, increased engagement with content published in a peer-reviewed radiology journal.

Key Words: Social media, peer review, medical journals, Twitter

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INTRODUCTION

Many peer-reviewed medical journals have recently begun using social media tools, such as blogs, Facebook pages, and Twitter profiles, to increase awareness and distribution of journal content. However, the impact of increasing use of social media outlets by peer-reviewed medical journals is unknown. Despite the known correlation between increasing social media attention and article citation rates [1], it is unknown whether the social media attention an article receives is a result of the article's importance or whether social media itself increases the reach and influence of peer-reviewed material.

Two recent studies by Fox and colleagues concluded that using a journal's Facebook and Twitter account to post about journal content on social media sites did not

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increase the number of times an article was viewed when compared with a randomized control group [2,3]. However, the referenced studies did not use editorial board members' personal social media accounts to aid in distribution. "Push-only" tweets and Facebook posts from businesses and brands have been shown to have less engagement than those from personal social media profiles [4], which may account for the lack of social media impact observed by Fox et al. Thus, the purpose of this study is to prospectively analyze the short-term impact of social media activity from both the journal's Twitter account and Twitter activity from editorial board members on engagement with peer-reviewed content from a single medical journal. We hypothesize that increasing levels of social media activity and personal engagement will increase weekly and monthly page visits and web link clicks of content published in the *Journal of the American College of Radiology* (JACR).

METHODS AND MATERIALS

Study Groups

We designed a three-arm (control arm and two Twitter intervention arms) randomized controlled trial evaluating the efficacy of a Twitter intervention to enhance engagement with articles published in the JACR. The basic Twitter arm consisted of a single tweet from the @JACRJournal Twitter account per article per day. A single JACR editorial staff member manned the @JACRJournal account and sent out the tweets. In the enhanced Twitter arm, articles were assigned to one of four Twitter teams. Each team of four consisted of three editorial board members and one member-in-training (Table 1). Each team received the same set of instructions from a single study investigator. Rules of social media engagement for the basic and enhanced Twitter arms are described below. The article-specific tweets for the intervention arms were sent between September 14, 2015, and October 28, 2015. Articles assigned to the control arm received no planned social media activity.

An a priori power analysis indicated 126 articles per arm would be needed to detect a statistically significant difference for a two-arm comparison assuming 80% power, a 5-point difference, and a standard deviation of 15 points. Because the enhanced Twitter arm had multiple teams, we inflated the sample size to 176 articles (44 articles per team) in this arm to have sufficient power to detect between team differences assuming 80% power and a 9-point mean difference with a standard deviation of 15. We used an 8-block randomization scheme (University of Michigan Center for Statistical Consultation and Research Treatment Assignment System for Research Trials, Ann Arbor, Michigan, USA) to assign articles to the main treatment arms and to the individual teams within the enhanced intervention arm. A total of 428 articles were randomized in reverse chronological order. The basic Twitter arm was assigned 126 articles; the enhanced Twitter arm, 178 articles; the control arm, 124. Within the enhanced Twitter arm, teams 1 and 3 were assigned 44 articles; teams 2 and 4, 45 articles.

Study Articles

We identified all original articles, recurring columns, and case studies between June 2013 and July 2015 using Adobe Analytics (Adobe, San Jose, California, USA). The investigator team selected the recurring columns included by consensus to be of general and continuing interest. All of the articles were available online as of the date of the randomization (August 5, 2015). Articles were grouped into original articles or other article type. Randomization also aimed to equally distribute different types of original articles, such as white papers and ACR Appropriateness Criteria manuscripts. Each arm received the same proportion of original articles to other article types (1.6).

Rules of Social Media Engagement

For the basic Twitter arm, a single tweet was posted for each article on the assigned day over the course of the study period. A single member of the editorial staff posted each tweet on the @JACRJournal account, with freedom

Table 1. Number of Twitter followers at the onset of the study period for each team member in the enhanced Twitter intervention arm

Team Member	Team 1	Team 2	Team 3	Team 4
1	2,865	3,986	13,000	3,474
2	1,164 (trainee)	1,972 (trainee)	2,134	1,278 (trainee)
3	1,123	187	782	848
4	266	92	378 (trainee)	269
Average	1,355	1,559	4,074	1,467