Social Media as a Platform for Surgical Learning

Use and Engagement Patterns Among Robotic Surgeons

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In response to technological advances and growing dispersion of surgical practice around the globe, social media platforms have emerged in recent years as channels for surgeons to share experiences, ask questions, and learn from one another. To better understand surgeons' engagement with these platforms, we analyzed data from a closed-membership Facebook group for robotic surgeons. Our analysis revealed that surgeons posted more frequently on midweek days, and further that text posts received significantly more comments, and significantly fewer "likes," than posts containing links, photos, or videos. We discuss the implications of these use and engagement patterns for the viability of social media platforms as tools for surgeons to learn vicariously from their peers' experiences and expertise.

Keywords: Robotic surgery, social media, surgical education, vicarious learning

(*Ann Surg* 2018;267:233–235)

Learning from others' experience and sharing knowledge through informal peer interactions is an important component of surgeons' ongoing development, with prior research finding, for instance, that surgeons' level of peer interaction is associated with higher performance on maintenance of certification exams.[1] These peer interactions provide an opportunity for vicarious learning—learning that comes from being exposed to and making meaning of others' actions and consequences—complementing individuals' learning from their own experiences in ways that allow them to improve their performance by not repeating others' mistakes or "reinventing the wheel."[2,3] Yet, opportunities for this kind of learning are not always readily available in surgeons' local environment (eg, for surgeons in solo practice[1]), and as the field of surgery continues to grow and disperse globally, a variety of social media platforms have emerged to provide opportunities for this kind of peer interaction.[4–7] In particular, closed-membership Facebook groups have gained popularity, since the inception of the International Hernia Collaboration,[8] as they provide surgeons with an opportunity to present (deidentified) cases, ask questions, offer suggestions, and gather peers' experiences with similar cases or challenges.[6]

EXPLORING USE AND ENGAGEMENT PATTERNS

However, despite this recognition of the potential benefits of these social media platforms for learning from others' experiences, our empirical understanding of important aspects of surgeons' usage and engagement with these platforms remains limited. For instance, social media differs from face-to-face environments in that surgeons could post content for others' feedback and reaction at any time (ie, not only during working days), and understanding when surgeons make use of these platforms to post content can help increase their utility and adoption. Moreover, social media platforms provide the opportunity to post not only text (ie, stories, questions, or descriptions of cases), but also multimedia content, and understanding how surgeons engage with these different types of content can provide useful information about how to facilitate vicarious learning on these platforms. For example, a recent review highlighted the role more active, agentic engagement and interaction about another's experience (vs just passive observation or dissemination of codified "best practices") can play in enhancing vicarious learning in complex settings such as healthcare.[2] In a Facebook group, members have the opportunity to engage both actively and passively with others' posts by commenting (active interaction) or "liking" (passive acknowledgement) the post, allowing for an examination of these different patterns of engagement across different types of post content.

METHODS

To better understand these patterns of use and engagement with a social media platform for learning and peer interaction, we evaluated data on all posts made in the "Robotic Surgery Collaboration" Facebook group[9] from the group's inception in January 2015 through August 2016. Specifically, we examined surgeons' posting behavior, comparing the relative frequency of posts made at different times during the week (ie, comparing the number of posts made on days during the middle of the work week to those made on other days), as well as their active (comments) and passive (likes) responses to different types of posts, comparing the number of comments and likes received by posts containing text, links, photo content, and video content.

Using the Grytics program,[10] we obtained data on the number of total members and active members [defined as members who have posted, commented, or reacted to (eg, liked) a post[10]] in the group during each month of the study period (see Fig. 1A), as well as data on each post made during the study period (n = 1278 posts). We calculated the number of posts made each day (based on each post's recorded timestamp) during the study period (January 8, 2015–August 31, 2016; n = 602 days). To capture posting behavior during working days, we identified posts made on days in the middle of the work week ("midweek" days; n = 258 days), which we defined conservatively (due to differences in time zones among posters) as Tuesday, Wednesday, and Thursday. We further controlled for the month-year of each day in the study period, to account for growth in group membership and activity over time.

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AAG is supported through grants from the Agency for Healthcare Research and Quality (Grants #5K08HS02362 and #P30HS024403) and a Patient Centered Outcomes Research Institute Award (CE-1304-6596).

OYK is the founder and one of the group administrators of the Robotic Surgery Collaboration Facebook group. He serves as a paid consultant to Intuitive, Medtronic, Gore, Bard, and Medrobotics. CGM has no relevant disclosures. The authors report no conflicts of interest.

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ISSN: 0003-4932/17/26702-0233
DOI: 10.1097/SLA.0000000000002479

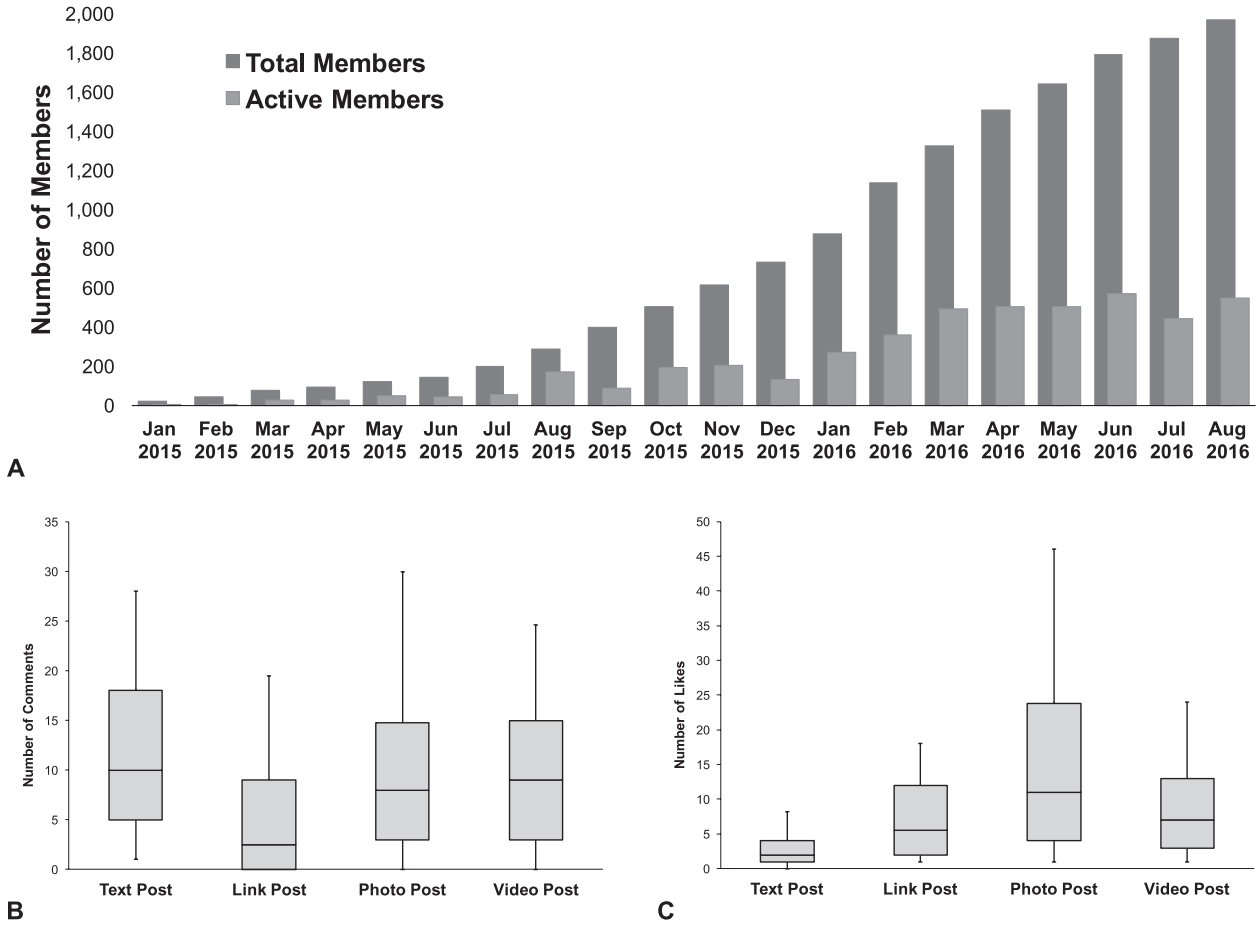

FIGURE 1. A, Number of total and active group members by month of the study period. B and C, Box and whisker plots of median comments and likes per post by post-type. Plots display the median (black horizontal lines), interquartile range (box plots indicate the 25th–75th percentile range), 10th and 90th percentile values (lower and upper whiskers, respectively).

Grytics also provided the content type of each post—those with only text (n = 507), and those that also included a link (n = 104), photo content (n = 244), or video content (n = 423)—and the number of comments and likes received by each post (we included all comments and likes made by September 8, 2016 on posts made by the end of the study period on August 31, 2016; see Fig. 1B, C). We also controlled for posts authored by group administrators (which may have altered group members' pattern of responses), whether posts were made on midweek days, and the month-year of each post.

Negative binomial regression (using SPSS Statistics 24 [IBM Corp, Armonk, NY]) was used to estimate incidence rate ratios (IRRs) for the number of posts made on midweek (vs other) days and the number of comments and likes received by posts of different types. Two-sided P values less than 0.05 were considered statistically significant. The Good Samaritan Medical Center Institutional Review Board reviewed and approved this study as exempt to IRB follow-up.

RESULTS

Controlling for differences in daily number of posts in each month-year, the number of posts per day was 47% greater on midweek days than on other days [IRR = 1.47 (95% CI, 1.29–1.67), Wald $\chi^2 = 35.26$, $P < 0.001$]. Further, text posts received significantly more comments, and significantly fewer likes, than each other post type (controlling for whether a post was made on a midweek day, post year-month, and post author). Relative to text posts, link posts received 65% fewer comments [IRR = 0.35 (95% CI, 0.28–0.44), Wald $\chi^2 = 77.09$, $P < 0.001$], photo posts received 26% fewer comments [IRR = 0.74 (95% CI, 0.63–0.87), Wald $\chi^2 = 13.32$, $P < 0.001$], and video posts received 28% fewer comments [IRR = 0.72 (95% CI, 0.62–0.83), Wald $\chi^2 = 21.30$, $P < 0.001$]. However, relative to text posts, link posts received 79% more likes [IRR = 1.79 (95% CI, 1.41–2.27), Wald $\chi^2 = 23.12$, $P < 0.001$], photo posts received 276% more likes [IRR = 3.76 (95% CI, 3.17–4.47), Wald $\chi^2 = 228.32$, $P < 0.001$], and video posts received 129% more likes [IRR = 2.29 (95% CI, 1.96–2.66), Wald $\chi^2 = 113.33$, $P < 0.001$].

DISCUSSION

Evaluation of data from the Robotic Surgery Collaboration Facebook group demonstrates significant growth in membership (to almost 2000 members by the end of the study period; Fig. 1A), and further reveals interesting patterns in surgeons' use and engagement with this platform for interacting and learning from one another.

Surgeons appear to post on the platform more often during the middle of the week, and text posts receive more active engagement (comments) than multimedia posts, while multimedia posts receive more passive responses (likes) than text posts.

Implications for Practice

The growth in this group over time suggests that surgeons found it useful for engaging in informal interactions and learning vicariously from one another, but also reveals that not all users were actively engaged in these interactions each month, and that growth in active membership differed from growth in overall group membership (as evident in the stagnating growth of active members, despite continued growth in total members, in the final 6 mo of the study period; Fig. 1A). Moreover, the predominance of midweek posts suggests that group members may engage with this online social media platform as part of their weekly workflow rather than in ''free time'' (eg, on weekends), and the relatively higher frequency of active engagement with text posts suggests that simply posting questions or written case summaries still offers value for surgeons, even when interacting on a multimedia-rich platform. This active engagement and interaction is important, as it can improve surgeons' vicarious learning by allowing them to discursively react to one another's ideas and coconstruct a more robust, detailed understanding of their experiences (rather than just passively receiving others' perspectives).[2,3] Our results suggest that this interaction (via commenting) is generated most often through text posts (eg, posting a narrative or question), implying that surgeons need not post photos or videos to generate the kind of online discourse that might aid their learning. Indeed, these media-rich posts tended to generate higher levels of passive engagement (relative to text posts), suggesting that additional efforts or interventions may be needed to transform passive acknowledgement of these posts into active interaction, in order to provide the best opportunity possible for surgeons to learn from their peers' experiences and expertise.

Despite these key implications for the use of social media platforms as a surgical education tool, we note that this analysis is limited to a single closed-membership Facebook group based on data from a third-party analytics program, and may not be representative of all surgical or medical social media platforms. More empirical studies—particularly those exploring the content of posts and comments in greater detail, examining group sustainability over longer time periods (particularly in light of the stagnating trend in active membership identified above), and addressing issues of privacy, discoverability, and patient confidentiality[4,6,7] —are needed to advance the understanding and uptake of social media tools as platforms for peer interaction and learning among surgeons.

ACKNOWLEDGMENT

The authors thank Ruth Cassidy for her guidance on statistical analysis.

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