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Analyzing the Proliferation of Social Media Use Among Orthopaedic Surgery Residency Programs

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Background: Social media can influence how students and residents learn about and select graduate medical education programs. COVID-19-related travel restrictions forced residencies to adapt their recruitment strategies. The objective of our investigation was to characterize the prevalence of social media use by orthopaedic surgery residency programs and to examine any change over time before the COVID-19 pandemic and leading up to the 2020 to 2021 virtual interview season.

Methods: The Fellowship and Residency Electronic Interactive Database was queried for all orthopaedic surgery residency programs (N = 164). We performed a cross-sectional analysis on the use of Facebook, Twitter, and Instagram by orthopaedic surgery residency programs in May 2019, July 2020, and November 2020. Orthopaedic surgery residency programs were systematically identified on each of the social media platforms. Descriptive statistics were used to facilitate comparisons between the time points.

Results: Seventy-six social media accounts were identified in May 2019 compared with 239 in November 2020—a greater than 300% increase in 19 months. The prevalence of residency programs using Facebook increased from 21.3% in May 2019 to 30.5% in July 2020 to 36.0% in November 2020. Similar increases in prevalence were identified for Twitter (15.2%-31.7% then 43.9%) and Instagram (9.1% to 37.2% to 65.9%). In May 2019, we identified 35 programs with Facebook accounts, 26 with Twitter accounts, and 15 with Instagram accounts. By November 2020, this increased to 59 Facebook accounts, 72 Twitter accounts, and 108 Instagram accounts. This corresponds to an expansion in the use of each platform by 69%, 177%, and 620% for Facebook, Twitter, and Instagram, respectively.

Conclusions: The use of social media by academic orthopaedic surgery residency programs increased substantially over the study period. The adoption of Instagram seems to be occurring at the fastest rate. Social media may represent a useful tool in resident recruitment, but the platform must be carefully selected and planned to avoid unintended dilemmas.

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Social media has become ubiquitous in modern society. Recently, Facebook reported a total of almost 2 billion daily active users¹. Instagram and Twitter also boast considerable user bases. These platforms are visited by roughly 75% of users at least once a day². Many people have mixed feelings about social media and its impact. In fact, a majority of Americans believe social media has a mostly negative effect on the current state of affairs in the United States³. Regardless, it seems as though social media would not be going anywhere for the foreseeable future.

In the orthopaedic surgery community, much of the discourse about social media has focused on its role in practice management and patient outreach. From the provider and practice perspective, there are numerous advantages to the use of social media. It can help with communication and connection with patients, potentially improving patient-centered care. In addition, it can serve as a valuable marketing tool and may help reach new patients^{4,5}. The role of social media in the academic realm, particularly in resident and fellow selection and recruitment, is less well-described. In other specialties, multiple authors have suggested that social media can impact how students and residents learn about and select graduate medical education programs^{6,7}. By contrast, social media has largely been underused as a recruitment tool in orthopaedic surgery. Residency programs have been forced to adapt in the face of the COVID-19 pandemic and an entirely virtual interview season. With applicants unable to perform away rotations or visit programs in-person, many programs have turned to social media as a new way to reach applicants. Because of this, we sought to characterize the prevalence of social media use by orthopaedic surgery residency programs and to examine any change over time before the COVID-19 pandemic and leading up to the virtual interview season. Our hypothesis was that a dramatic increase in social media use by residency programs would be identified by our analysis.

Materials and Methods

This investigation was exempt from Institutional Review Board approval as all information is publicly available.

Study Design

The Fellowship and Residency Electronic Interactive Database was queried for all orthopaedic surgery residency programs in May 2019. A total of 164 orthopaedic surgery residency programs were identified. Using this list of programs, we then performed a cross-sectional analysis on their use of 3 popular social media platforms (Facebook, Twitter, and Instagram). A comprehensive search strategy was used to identify accounts for every residency program on each of the 3 platforms. We considered all social media accounts associated with academic orthopaedic surgery programs including residency only, departmental only, or a combination of the 2 as part of our identification process. Our cross-sectional analysis was completed at 3 separate time points. The first search was performed in May 2019 as part of an initial survey that was intended to be

the foundation of a separate study. In the early days of the COVID-19 pandemic, we anecdotally noted more programs entering the social media sphere. We then performed 2 additional search cycles—one in July 2020 (before fourth year medical students submitted residency applications) and another in November 2020 (immediately before the 2020-2021 virtual interview season).

Search Strategy

Our comprehensive search strategy began with the identification of each residency program's website, where we attempted to find links to their social media profiles. If this was unsuccessful, we next used each social media platform's search feature. This combination of search steps was typically the most successful. If both failed to identify a social media profile, a Google search was then performed, using the text "(Program name) Orthopaedic Surgery Residency (Facebook, Twitter, or Instagram)". A Google search was performed for every program and each of the social media platforms when the first 2 steps failed to identify a social media profile on the respective platform.

Statistical Analysis

The prevalence of orthopaedic surgery residency programs on each platform was calculated. The number of followers for every program on each platform was recorded as a surrogate for the level of engagement or activity on that platform. Descriptive statistics were used to summarize the data and facilitate comparisons between each platform and each time point. Analysis was performed using Stata statistical software (StataCorp LLC).

Results

A total of 76 social media accounts were identified across all 3 social media platforms in May 2019 compared with 239 in November 2020, representing a greater than 300% increase in a span of approximately 19 months. The prevalence of residency programs using Facebook increased stepwise during the study period from 21.3% in May 2019 to 30.5% in July 2020 and then to 36.0% in November 2020. Similar increases in prevalence were identified for Twitter and Instagram—15.2% to 31.7% to 43.9% and 9.1% to 37.2% to 65.9%, respectively (Table I). Although each platform experienced an increase in use, Instagram saw the largest increase at the fastest rate, with prevalence increasing 1.9% per month between the first and second surveys. It increased at an even faster rate between the second and third surveys at 5.7% per month.

TABLE I Prevalence of Social Media Use of Facebook, Twitter, and Instagram at Each Study Time Point

	May 2019	July 2020	November 2020
Facebook	21.3%	30.5%	36.0%
Twitter	15.2%	31.7%	43.9%
Instagram	9.1%	37.2%	65.9%

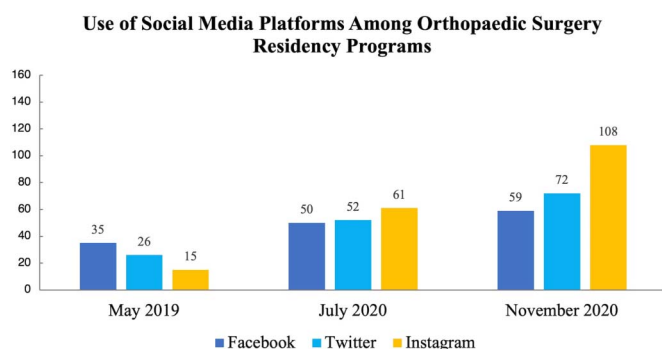


Fig. 1
Number of orthopaedic surgery programs using each social media platform across study time points (N = 164).

When examining the absolute number of social media accounts per platform, we identified 35 programs with Facebook accounts, 26 with Twitter accounts, and 15 with Instagram accounts in May 2019. These figures increased to 50 programs with Facebook accounts, 52 with Twitter accounts, and 61 with Instagram accounts in July 2020. Then, in November 2020, we identified 59 Facebook accounts, 72 Twitter accounts, and 108 Instagram accounts (Fig. 1). This corresponds to an expansion in the use of each platform by 69%, 177%, and 620% for Facebook, Twitter, and Instagram, respectively.

To examine the level of engagement or activity experienced on these mediums, we assessed the number of followers each program had on each platform. These data are presented in Fig. 2 as the total number of followers and in Table II as the median number of followers with an interquartile range since they were largely non-normally distributed. Facebook accounts had the most followers at all 3 time points (149,475 in May 2019, 161,181 in July 2020, and 184,915 in November 2020). Twitter had the second most followers as of May 2019 (63,168) and maintained this position through July 2020 (80,684).

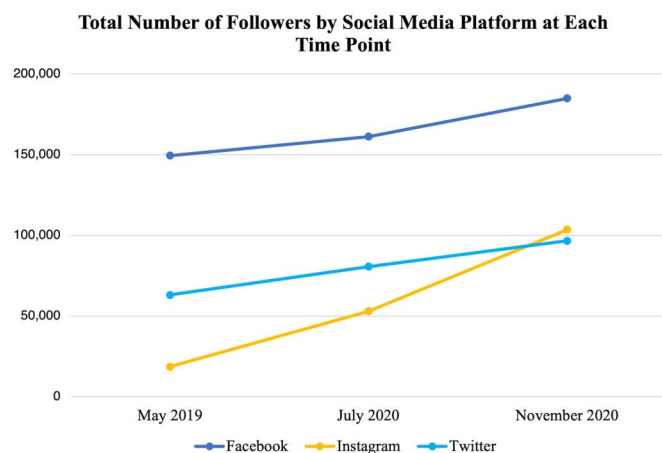


Fig. 2
Total number of followers on each social media platform across study time points.

	May 2019	July 2020	November 2020
Facebook	466 (93-1,290)	355 (91-1,196)	300 (96-1,257)
Twitter	346 (55-827)	203 (96-702)	312 (152-702)
Instagram	130 (85-541)	517 (206-711)	887 (474-1,089)

Presented as median number of followers per program and interquartile range because of non-normal distribution of data.

However, it was quickly surpassed by Instagram from July 2020 to November 2020 when Instagram accounts had 103,630 followers compared with 96,656 followers across Twitter accounts. Instagram experienced the fastest rate of increase over the study period from only 18,628 followers in May 2019 to 53,043 followers in July 2020 to 103,630 followers in November 2020. The median number of followers per program on Facebook decreased over the study period from 466 to 300. For Twitter, the median number of followers remained relatively flat (346 to 312). By contrast, engagement on Instagram increased stepwise across the study time points from 130 median followers in May 2019 to 517 in July 2020 and ultimately 887 in November 2020.

Discussion

Social media platforms such as Facebook, Twitter, and Instagram have been largely underused by orthopaedic surgery residency programs in the recruitment process before 2020. In accordance with our hypothesis, we demonstrate a rapid expansion in the use of social media among orthopaedic surgery residency programs. Although this trend may have naturally transpired at a slower rate, the adoption of social media by residency programs seems to have been expedited by the COVID-19 pandemic and the obstacles it imposed on the 2020 to 2021 application season. The prevalence of accounts on all 3 platforms increased, but Instagram saw the largest growth at the fastest rate. Our data suggest social media may be a useful recruitment tool in the face of limited in-person contact between applicants and programs. Ultimately, we believe social media will continue to be an important component of recruitment moving forward.

Similar expansion in the use of social media by residency programs has been documented in the fields of general surgery, plastic surgery, and otolaryngology⁹⁻¹¹. These efforts have been generally appreciated from the applicant perspective with the sentiment that social media offers an engaging and humanizing outlet for recruitment¹¹. This represents a transition from what we noted in surveying applicants in 2018 to 2019. At that time, applicants noted limited frequency of use and poor quality of social media-based information encountered while navigating the application process⁸. Applicant dissatisfaction can likely be explained by a paucity of residency activity on social media

which is reflected in the relatively low number of social media accounts identified at our first search. With residency programs filling the relative void, significant promise exists for improving the ability of applicants to access information about residency programs. Modern applicants seem to place a premium on factors such as perceived happiness and quality of life of residents and the sense of camaraderie between residents¹². Social media can be a useful tool in highlighting these features of a program in addition to overall culture and day-to-day activities.¹¹

The rising popularity of social media is not surprising. Most residency candidates are in the range of 18 to 29 years old, which represents the demographic with the highest reported social media usage¹³. Although Facebook accounts had the most total followers, this likely represents the impact of a few outlier programs with exceptional brand recognition, and these counts may not best represent the applicant demographic. Instagram demonstrated the most pronounced increases in prevalence and engagement. We believe this is largely due to the fact that Instagram has demonstrated comparatively greater popularity among younger demographics². In either case, it seems as though residency programs are attempting to provide information to applicants on the platforms they already use. The effectiveness of these outreach endeavors remains to be determined.

Although our study demonstrates a rapid increase in social media use by orthopaedic surgery residency programs, this has landed our community in relatively uncharted territory and has generated a number of interesting dilemmas. Namely, how do applicants perceive and digest the content and information produced by residency programs on these platforms? Should they interact with and engage residency programs on social media? Not long ago, many applicants simply purged their social media accounts or changed their names on those accounts before applying to residency to avoid any potential impact on their prospects¹⁴. Program directors have used social media as an additional evaluation tool and many admitted to changing applicants ranking based on the information^{15,16}. More recently, Rohde et al. suggested a unidirectional flow of information to minimize risk to applicants¹¹.

Other important considerations involve how residency programs approach social media. Residency programs must be cognizant of the information they provide to applicants. Are they sharing content that is an accurate representation of the program? It may be important to consider who is the best representative of the program and who should manage the account(s). In addition, although the intended audience may be applicants, anything posted on social media through a public account can be seen by anyone anywhere in the world who has access to that platform. Information that is attractive to applicants may not be similarly received by patients, administrators, or lawyers. Finally, adhering to the law is arguably the most important consideration relevant to the use of social media in healthcare settings. As healthcare providers, compliance with regulations is part of our professional obligation to our patients and their confidentiality. Clearly, there is much to be learned.

We acknowledge several limitations of our investigation. First, our cross-sectional study design focuses on 3 isolated points in time and cannot account for all the temporal factors that may impact the growth trend in social media use by orthopaedic surgery residency programs. Second, our data and the identification of social media accounts attributable to residency programs are subject to the quality of our search strategy. Although we attempted to design and use a robust search strategy, it is possible that some programs went unaccounted. Third, we considered all social media accounts associated with academic orthopaedic surgery programs including residency only, departmental only, or a combination of the 2 as part of our identification process. Although these definitions may affect our counts, their impact is likely minimal, and the overall trend holds true. Despite these issues, there are several strengths to our study. We were uniquely positioned to assess the change in social media use in relation to the COVID-19 pandemic as we had already looked at the number of accounts as a component of other research in 2019. We used a comprehensive and systematic search strategy. Our investigation is the first to examine trends in the use of social media by orthopaedic surgery residencies.

Conclusion

Recently, there has been a relatively rapid evolution in the social media landscape in orthopaedic surgery. The number of orthopaedic surgery residency programs with accounts on Facebook, Twitter, and Instagram increased dramatically over a relatively short period. In particular, Instagram experienced a significant expansion in use and has been especially popular. Although social media has the potential to be a valuable tool for resident recruitment in the digital age, there are a number of important considerations that require further understanding to ensure that it is used effectively. ■

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