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Analysis of Social Media Perceptions Among Orthopaedic Surgery Residency Applicants and Social Media Use by Residency Programs During the 2020 to 2021 Cycle

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Introduction: Owing to the coronavirus 2019 pandemic limiting both applicants and residency programs in their ability to connect in-person, it is likely that a shift toward virtual connections was made. We aimed to query applicants regarding their perspectives of orthopaedic residency program social media use. Furthermore, we aimed to quantify the number of orthopaedic surgery residency programs with active social media accounts.

Methods: All applicants to a single orthopaedic surgery residency were surveyed regarding their perceptions of social media use by orthopaedic surgery residency programs. After this, we evaluated social media use by orthopaedic surgery residency programs.

Results: Of total, 54.3% of applicants indicated that an orthopaedic surgery residency program they followed on social media posted content that increased their interest in the program. Furthermore, 77.8% of the applicants believed that orthopaedic surgery residency programs should have social media accounts, specifically Instagram. Of the orthopaedic surgery residencies identified, 113 (58.9%) had Instagram, 84 (43.8%) had Twitter, and 21 (10.9%) had Facebook accounts.

Discussion: Applicants largely feel that orthopaedic surgery residencies should have social media accounts. Orthopaedic surgery residencies saw the value in connecting with students virtually, as shown by nearly 90% of the programs, with social media starting their accounts this year.

Social media use has exponentially increased over the past decade. The overall use of social media has increased from 21% of Americans in 2010 to 79% in 2019¹. Furthermore, nearly 90% of healthcare workers have social media accounts². As such, social media has become a way of spreading evidence-based

medical information during the coronavirus 2019 (COVID-19) pandemic³ and for orthopaedic-related topics, such as arthritis⁴.

Social media is also being used on the individual healthcare provider level. It has become an increasingly popular avenue for healthcare providers to share information and network and

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engage in self-promotion⁵⁻⁷. A recent study evaluating social media growth on Twitter indicates specialty-specific increases in tweets by physicians of nearly 600%, and an increase in physician professional Twitter accounts of nearly 1,300% over the past 6 years⁸. Because professional social media pages become increasingly common among individuals, the creation of pages has been expanded to specialty societies, medical schools, and even individual residency programs.

Social media use among residency programs has been studied in several different fields. In otolaryngology, recent studies found that 61% of residency programs have a dedicated social media page,^{9,10} which is over double the number of programs engaging in social media in late 2018¹¹. Furthermore, it was demonstrated that the COVID-19 pandemic resulted in an increased use of social media by these residency programs⁹. In plastic surgery, a recent study found that nearly 60% of residency programs had dedicated social media pages¹². The perception of the rise in use of social media by residency programs was recently published from an applicant's perspective, wherein they state "programs'" recent use of social media has been informative and humanizing. It is our hope that departments, programs, and residents continue to post on social media throughout the application cycle¹³.

The primary objective of this study was to query applicants regarding their perspectives of orthopaedic residency program social media use. Furthermore, we aimed to quantify the number of residency programs with active social media accounts. Our hypothesis was that applicants look positively on orthopaedic surgery residency programs having social media and that the number of programs with social media accounts is similar to the published studies in other fields.

Methods

After IRB approval by our institution, a comprehensive list of all applicants to our institutions' orthopaedic surgery residency for the 2020 to 2021 application cycle was compiled. These applicants all applied through a third-party application system through the Electronic Residency Application Service (ERAS). Next, a survey comprising 26 questions (Appendix) was e-mailed to each student through the e-mail they provided to ERAS. The e-mail stated that their response was voluntary and anonymous, and participation would not affect their standing at our institution. To ensure complete anonymity, no demographic variables were included in the survey because these likely could be able to be traced back to each applicant. The survey was sent during the 2020 to 2021 application season on November 21, 2020, to allow applicants ample time to apply to our program should they desire. The survey was only sent once to prevent the chance of duplicate entries and bias by the same applicant because it was an anonymous survey. The survey was maintained throughout the application cycle and closed on February 1, 2021 (when rank list submissions opened). There were no incentives made to the students for completion of the survey.

Next, using the ERAS system, a list of all accredited orthopaedic surgery residencies participating in the 2020 to 2021 match

was extracted. Each program was searched on Instagram and Twitter and using the following procedures.

Programs were searched on Twitter, Instagram, Facebook, and Google in a uniform manner. Program names as listed on the ERAS orthopaedic residency list were searched in conjunction with the following phrases: "***SAMPLE PROGRAM NAME** orthopedic residency," "***SAMPLE PROGRAM NAME** orthopedic residency Twitter," orthopedic residency Instagram, "orthopedic residency Facebook," and then "***SAMPLE PROGRAM NAME** orthopedics." If no returns were made for the above procedures, there was an opportunity to search common "short names" or abbreviations of the program names. This was performed using the same procedures as was performed for the initial searches. No more than 3 additional attempts to find the program with shortened/abbreviated names were used to maintain consistency in search criteria. For example, Orthopaedic State University would be shortened to common vernacular, such as "Ortho State or OSU". If a program was not found on completion of the aforementioned methods, a final attempt was made by searching their residency website to see whether a link to residency-specific social media pages was provided. Data were extracted by 2 separate blinded members of this study. We elected to not contact program coordinators if we were unable to locate a program's social media account because if a program's social media could not be found using a standardized, dual, and blinded methodology, they would likely not be found by applicants.

Statistical analysis was performed using Comprehensive Meta-Analysis software to quantify our results regarding social media perceptions by orthopaedic surgery residency applicants. Included analyses were percent, mean, median, and range. Statistical comparisons were analyzed using paired *t* tests and Fisher exact test with a prespecified significance threshold set at $p = 0.05$.

Results

A total of 347 applicants were eligible for inclusion, and our survey was sent to the e-mail provided in their ERAS profile. Of these 347 applicants, 127 (36.6%) responded to our survey.

Applicant-Specific Social Media Engagement

Of the applicants responding to our survey, 113 (89.0%) indicated that they had a social media account. Forty-seven (37.0%) indicated that they used 3 separate social media platforms, and 44 (34.6%) indicated that they used 2. When asked what the most commonly used social media platform by each applicant, the results were (1) Instagram (60/127, 47.2%), (2) Facebook (36/127, 28.3%), and (3) Twitter (17/127, 13.4%) (Fig. 1).

Applicant's Following of Orthopaedic Surgery Residency Programs

Of the respondents, 65 (51.2%) indicated that they had used social media to learn about orthopaedic surgery residency programs before applying. Furthermore, 70.4% of the applicants with social media follow orthopaedic surgery residency program. In total, 54.3% of applicants indicated that an orthopaedic

What is your most commonly used form of social media?

127 responses

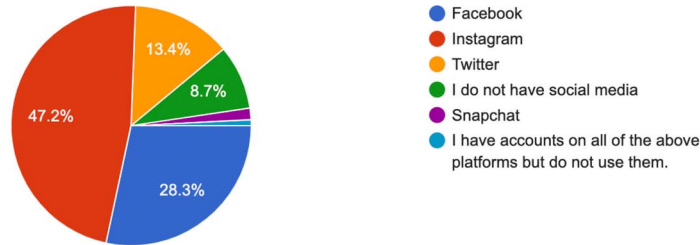


Fig. 1 Most commonly used social media by each applicant respondent.

surgery residency program they followed on social media posted content that increased their interest in the program (Fig. 2). Conversely, 13.4% of applicants reported that an orthopaedic surgery residency they followed on social media posted content that decreased their interest in the program (Fig. 3). Of total, 10.2% of applicants reported that they applied to a specific residency program solely based on content they posted on social media, whereas 7.1% of applicants indicated that they made a decision to not apply to a specific program based on what they posted on social media. Applicants were asked to select their top 3 options for posts that have made the greatest impression on them as a student (Table I). The resounding top 3 were as follows: (1) meet the residents and posts about residents (79 applicants, 62.2%), (2) posts about life outside of residency (66 of 127, 52.0%), and (3) meet the attendings and posts about attendings (54 applicants, 42.5%). Interestingly, operative room images left the smallest impression, with only 24 applicants (18.9%) choosing this in their top 3.

Applicant Contact with Residency Programs Through Social Media

Twenty-two (17.6%) of the applicants indicated that they had contacted a program from information provided by their social media accounts or had messaged their social media account directly. Furthermore, 27 (21.4%) of the applicants stated that they had gained valuable information from personally reaching

out to programs through social media accounts. Sixty-four (50.4%) of the applicants stated that they had attended an open house, educational session, or information session hosted by a residency after learning about the opportunity through social media. One hundred ten (86.6%) of the applicants indicated that they had attended at least 1 program’s virtual open house this year, with 59.5% of applicants attending 1 to 5 events, 21.4% attending 6 to 10 events, and 6.3% attending greater than 10 events. In comparison with open houses, 111 (87.7%) applicants attended at least 1 orthopaedic surgery program’s didactic session, with 44.1% attending 1 to 5, 29.9% attending greater than 10 and 13.4% attending 6 to 10 separate program’s didactic sessions.

Applicants’ Perception of Orthopaedic Surgery Residency Programs Having Social Media Accounts

Of the responding applicants, 98 (77.8%) perceive that orthopaedic surgery residency programs should have social media accounts (Fig. 4). When asked which social media platforms orthopaedic surgery programs should use, Instagram was the most commonly selected, with 94 applicants (75.2%) selecting this option (Table II). Twitter and Facebook were the second- and third-most selected option, with 56 (44.8%) and 52 applicants (41.6%) selecting these options. When asked which social media platforms provide the applicant the most benefit for having success in obtaining an orthopaedic surgery residency, Instagram was the most selected

Has an orthopaedic surgery residency ever posted anything on social media that increased your interest in that program?

127 responses

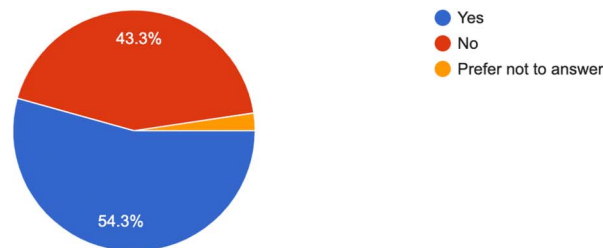


Fig. 2 Percentage of applicants in which social media posts by a residency program INCREASED their interest in the program.

Has an orthopaedic surgery residency ever posted anything on social media that diminished your interest in that program?

127 responses

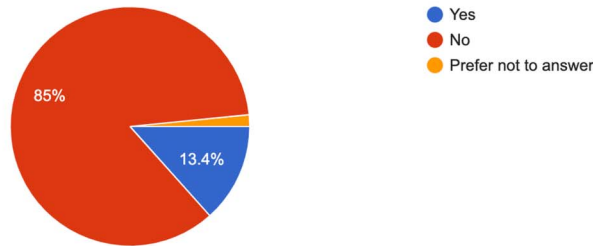


Fig. 3 Percentage of applicants in which social media posts by a residency program DECREASED their interest in the program.

platform, with 65 (52.4%) selecting this option. Thirty-two (25.8%) and 25 (20.2%) selected Twitter and Facebook, respectively.

Applicants Following of Orthopaedic Accounts Other Than Residency Programs on Social Media

Seventy applicants (55.62%) indicated that they did not follow any orthopaedic surgery journals on social media, whereas 43 (34.1%) selected that they follow 1 to 5 journals. Sixty-eight applicants (54.0%) follow at least 1 orthopaedic professional association on social media, with most (51.6%) following 1 to 5 associations. Ninety-two applicants (73.0%) did not follow any orthopaedic surgery industry companies on social media, whereas 34 (27.0%) follow at least 1 industry company on social media. Only 32 applicants (25.4%) indicated that they follow hashtags or trending topics in orthopaedics. Fifty-two applicants (41.6%) stated that they follow at least 1 orthopaedic surgery influencer account on social media.

Applicants’ Perception of COVID-19 on Orthopaedic Surgery Program Social Media Use

Fifty-seven applicants (45.2%) stated that COVID-19 and its effect on the application season increased the number of

orthopaedic surgery programs that they followed on social media. Furthermore, 83 applicants (66.4%) feel that COVID-19 resulted in more orthopaedic surgery programs starting social media accounts. Conversely, 30 (24.0%) of the applicants selected “unknown,” and 11 (8.8%) felt the COVID-19 pandemic did not increase orthopaedic residency program’s use of social media.

Orthopaedic Surgery Program Social Media Data

In total, 192 orthopaedic surgery residency programs were identified. Of these programs, 113 (58.9%) had Instagram accounts, 84 (43.8%) had Twitter accounts, and 21 (10.9%) had Facebook accounts (Table III).

Of the 113 programs with Instagram pages, the average number of followers was 917.1 (range: 20-3,837; median: 996). The average number of posts was 45.9 (range: 0-487; median: 34), and the average duration of activity was 9.2 months (range: 0-50; median: 7). Interestingly, 100 (88.5%) of the programs started their Instagram page within 2020 to 2021, corresponding to the COVID-19 pandemic.

Of the 84 programs with Twitter accounts, the average number of followers was 1,164.4 (range: 01-46,600; median: 353). The average number of posts was 713.2 (range: 0-12,900; median: 92), and the average duration since account creation was 36.6 months (range: 3-142; median: 20.5). Interestingly, 35 (41.7%) of the programs started their Twitter page within 2020 to 2021, corresponding to the COVID-19 pandemic.

Of the 21 programs with Facebook accounts, the average number of followers was 1,619 (range: 2-12,430; median: 179). Further data could not be elucidated because of varying information provided by each account.

Discussion

The medical establishment, including many residency programs across the nation, joined the conversation by increasing their online presence with social media accounts in 2020 during the COVID-19 pandemic. This is demonstrated by our data and reinforces the trends discussed in the aforementioned publications in plastic surgery and otolaryngology. The

TABLE I Posts Rated as Having Made the Greatest Impression on Students	
Type of Post	No. of Times Rated as Impressionable (%)
Meet the residents/posts about residency	79 (62.2)
Posts about life outside of residency	66 (52.0)
Meet the attendings/posts about attendings	54 (42.5)
Posts about cases	44 (34.6)
Posts about didactics	32 (25.2)
Operative room images	26 (20.5)
None of the above	24 (18.9)

Do you think orthopaedic surgery programs should have social media accounts?

126 responses

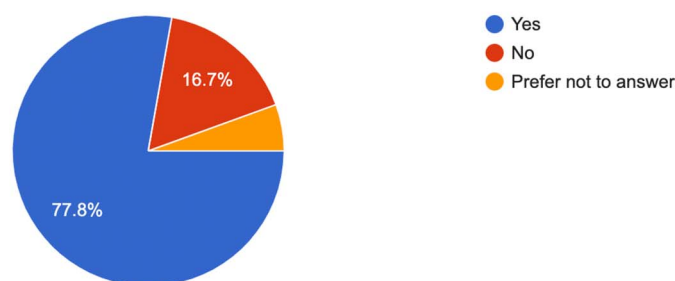


Fig. 4
Percentage of applicants who believe orthopaedic surgery residencies should have a social media account(s).

obstacles posed by travel restrictions, social distancing, and health precautions created a significant challenge to students, residency programs, and the accrediting bodies because the traditional subinternships and the subsequent interview season were shrouded in concerns for the safety of students and faculty alike¹⁴.

With equity in mind, the regulations were set in place to help students perform virtual rotations, and when safe, attend in-person audition rotations. Although this opened opportunity for some, most of the students who would have otherwise traveled to several programs outside of their home institution were left to peruse the internet in hopes of garnering a better understanding of the potential programs they would submit an ERAS application to. Herein lies the opportunity newly discovered by many orthopaedic residency programs: Social media platforms can and should be used as a means of communication with potential residents.

A harbinger of sorts, a 2011 article¹⁵ by Orrin Franko, MD, in *Orthopaedics* highlighted Twitter as a growing modality for communication in the world of physicians, medical centers, and orthopaedic residents. Furthermore, in recent studies, physicians have been found to generally agree that digital engagement can be beneficial to fostering relationships between doctors and patients, as well as among their health-care peers^{16,17}. This positive trend toward social media use in health care is also corroborated by orthopaedic professional societies and medical journals because they are actively engaged in using their online presence across various social media platforms to share data, articles, and press releases^{18,19}.

Our aim in this article was to outline the perception of social media use by orthopaedic surgery residencies by current applicants while also outlining the current state of orthopaedic surgery residency social media presence. Together, these data help to paint an image of the formative impact that social media may or may not have on the decisions made by students over where to apply and also how they garner their overall interest in a program. This work is akin to that performed by Shaath et al.²⁰ in their 2020 work reporting on fellowship applicants and their preferred mode of learning about fellowship programs, and moreover, how that method of communication affects their understanding of the program.

In addition, Narain et al.²¹ recently published work exploring similar concepts, although through the opposite perspective, with their onus being on the attending physicians and how they choose to use social media. These authors queried a database of subspecialist orthopaedists and cross-referenced the internet to better understand how these surgeons use online accounts to connect with colleagues and patients. The authors queried the 676 surgeons who were members of the American Shoulder and Elbow Society to discern which types of social media platforms these surgeons used.

Our article draws on similar objectives as studied by Shaath et al. and Narain et al. The former discovered attributes that applicants find favorable when searching for information on fellowship programs. Similar to this, our study evaluated attributes of social media platforms that orthopaedic surgery

TABLE II Applicant Perceptions on Social Media Accounts			
	Instagram	Twitter	Facebook
Which Social Media Platform Should Programs Use?	94 (77.8)	56 (44.8)	52 (41.6)
Which Social Media Platform Provides the Most Benefit to Applicants?	65 (52.4)	32 (25.8)	25 (20.2)

TABLE III Residency Program Social Media Account Data			
	Instagram	Twitter	Facebook
No. of programs with accounts (%)	113 (58.9)	84 (43.8)	21 (10.9)
Average number of followers	917	353	1,619
Average duration since account creation (mo)	9	36	n/a
Average number of posts	46	713	n/a

residency applicants found favorable. The top attributes found in our study that applicants looked favorably on from orthopaedic surgery residencies were

1. Having an Instagram account.
2. “Meet the Resident” or “Meet the Attending” posts.
3. Posts regarding life outside of residency.

Our findings regarding applicant social media preferences were in contrast to the findings of attending surgeon preferences seen in the study of Narain et al. In their study, 25.2% of attending surgeons had a Twitter account, and only 10.8% had an Instagram account, whereas in our study, nearly 90% of applicants used at least 1 of these common social media platforms, and the majority used more than 1 social media platform. Furthermore, orthopaedic surgery applicants have far greater usage and value of Instagram than attending surgeons. Nearly half of the applicants rated Instagram as their most used social media platform, and over 75% believed orthopaedic surgery residency programs should have an Instagram account. Here, we see a large discrepancy between older and younger generations in their social media use, one that attending surgeons, orthopaedic specialty societies, and residency programs alike ought to consider adopting to effectively connect to their future colleagues. Furthermore, our data indicate that engaging with applicants on social media is far more likely to increase applicants' interest in a program than it is to decrease their interest (Figs. 2 and 3). With a large proportion of residencies starting their social media journey during the COVID-19 pandemic, it is likely that social media becomes essential in recruiting top candidates in the coming years rather than online rankings, word of mouth, and proximity, as has been a key player in previous years.


Although our article fills an important gap in the literature, it is not without limitations. Potential selection bias can arise from data being skewed, secondary to programs with social media accounts missed because of programs using pseudonyms rather than their program name as their social media identity/handle. Future research should investigate regional differences in social media use by both the programs and applicants

because previous work has demonstrated different patterns in physician utilization based on region²¹.

Conclusions

Orthopaedic residency applicants largely feel that orthopaedic surgery residencies should have social media accounts, and posting on these social media accounts is far more likely to increase their interest than decrease their interest in a program. Orthopaedic surgery residencies saw the value in connecting with students virtually, among other reasons, as shown by nearly 90% of the programs with social media starting their accounts this year.

Appendix

 Supporting material provided by the authors is posted with the online version of this article as a data supplement at [jbjs.org \(http://links.lww.com/JBJSOA/A335\)](http://links.lww.com/JBJSOA/A335). This content was not copy-edited or verified by JBJS. ■

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