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A rise in social media utilization by U.S. neurology residency programs in the era of COVID-19

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ABSTRACT

Objective: To determine how neurology departments and residency programs in the United States used virtual communication to adapt to the COVID-19 pandemic, we investigated the presence and use of social media pages, virtual outreach events, and virtual internship opportunities.

Methods: Twitter, Instagram, and Facebook accounts were identified (or noted as nonexistent) for 159 accredited neurology departments and residency programs. Google searches and social media site specific searches were performed. For existing pages, the date of creation was determined and all posts on and after March 1st, 2020, were assessed to investigate the presence of virtual open house advertisements. Each program was also assessed for virtual sub-internship and elective opportunities on the Visiting Student Application Service (VSAS).

Results: A majority of neurology residency programs (110) had a social media presence, particularly on Twitter and Instagram. Most residency program Twitter and Instagram accounts were created after March 1st, 2020, and this was not the case on Facebook. Twitter and Instagram were used most to advertise virtual opportunities. A correlation was observed between presence and number of social media accounts and program prestige. Few programs offered virtual opportunities on VSAS for the 2020–2021 year.

Conclusion: Neurology residency programs adapted to the COVID-19 pandemic by creating residency social media accounts, primarily on Instagram and Twitter, and hosting virtual informational events. We recommend that neurology residency applicants create professional Instagram and Twitter accounts to network with programs and receive updates about virtual events. Similarly, going forward, we recommend continued social media use by neurology residency programs for applicant outreach.

1. Introduction

The COVID-19 virus has undeniably affected the world since it was declared a pandemic in March 2020 [1,2]. For medical education in the United States, the pandemic has altered the way in which medical students interface with residency programs. According to the American Association of Medical Colleges (AAMC), 55.5% of the 2019 class of graduating medical students participated in an away rotation during medical school [3]. In 2020, the AAMC recommended the immediate suspension of in-person visiting rotations and interviews for all medical students applying during the 2020–2021 cycle. As a result, applicant-program interaction will be virtual. While the transition to a virtual format has some benefits such as mitigating the cost of travel, applicants may suffer from reduced personal interaction with the program. Likewise, residency programs may have difficulty adequately assessing their pool of applicants.

Previous papers have suggested ways in which residency programs should adapt to the 2020 guidelines [4–6]. However, little work has been done to understand how residency programs have actually adjusted to restrictions. For one, despite inability to host in-person away rotations, programs maintain communication with applicants virtually. Virtual away rotations allow students to observe rounds and connect with residents and faculty [7]. Similarly, social media use and virtual informational sessions allow programs to showcase their attributes and field questions from potential applicants [6]. In this paper, we describe how neurology residency programs adapted to COVID-19 through social media outreach, virtual information sessions, and virtual and traditional away rotation opportunities.

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2. Methods

This study was retrospective in nature. A list of 160 neurology residency programs was retrieved from the Electronic Residency Application Service (ERAS), a comprehensive service designed in part to compile all accredited residency programs in a centralized space for future applicants to utilize. One program was excluded due to lack of online documentation of a neurology residency program when data was gathered. All programs were assessed for the presence of residency accounts on Twitter, Facebook, and Instagram. During initial data collection, it was discovered that many neurology programs also utilized their department accounts to advertise virtual residency program events. Therefore, search protocol was broadened to also identify neurology department accounts on social media in order to properly account for all social media virtual event advertisements related to neurology residency program information.

Google’s search engine and social media platform search engines were utilized for account identification. On the Google search engine, department and residency programs were searched using the corresponding school name followed by “neurology department” or “neurology residency program”, respectively, and the social media platform of interest. For example, to establish the presence of a Twitter account for Harvard University’s neurology residency program, “Harvard University neurology residency program twitter” was entered into Google and results were assessed for presence of a formal Twitter account. If there was no evidence of the account of interest, social media specific searches were conducted using the school name followed by “neurology department” or “neurology residency program”.

For identified accounts, social media posts were examined for announcements of virtual open houses or informational sessions. Program websites were evaluated similarly. Accounts were then assessed for establishment before or after the COVID-19 outbreak, defined specifically as before or after March 1st, 2020. For Twitter accounts, this information was clearly displayed in the account banner. Facebook account establishment was defined as the date of the first profile picture, and Instagram account establishment was defined as the date of the first post. The Visiting Student Application Services (VSAS) website was reviewed for virtual sub-internship or elective opportunities in neurology residency programs. All data was retrieved between October 19th, 2020, and October 22nd, 2020.

Programs were divided into quartiles based on rankings on Doximity. Doximity was used to rank programs instead of the U.S. World & News Report because Doximity delineated rankings by specific neurology residency programs, while the U.S. World & News Report established rankings by hospital. Doximity’s “reputation” rankings are weighted to produce reputation values that are based on the opinions of survey-eligible physicians [8]. Program data in each quartile was averaged and plotted as a line-of-best-fit on Microsoft Excel to assess for a relationship between relative prestige of residency programs and the presence and number of social media accounts associated with them. This relationship was established based on the coefficient of determination (R^2) value derived from the Spearman coefficient.

3. Data availability

The data described in this paper are readily available by request from the author investigators or on the internet through the use of Google, Twitter, Instagram, Facebook, residency program websites, and the VSAS website.

4. Results

4.1. Ownership and creation date of program social media accounts

Altogether, 110 (69.2%) neurology programs had some sort of social media presence, whether on Twitter, Instagram, or Facebook. A total of 226 accounts were found across neurology programs’ departments and residencies, an average of 1.42 accounts for each program. In total, 38 residency programs had a presence on one platform; 42 had a presence on two platforms; and 30 programs had a presence on all three platforms. Forty-nine programs had no social media accounts at the time of data collection.

Figs. 1 and 2 identify the number of social media accounts created before and after March 1st, 2020, for residency programs and departments, respectively. Departments had a greater presence on Twitter (25.8%) than Facebook and Instagram (17.6% and 8.8%, respectively). In contrast, residency program accounts were more common on Instagram (40.9%) than Twitter and Facebook (32.7% and 16.4%, respectively). More departmental Twitter, Instagram, and Facebook accounts were created before March 1st, 2020, compared to after. This trend is also seen for residency Facebook accounts. On the other hand, 92.3% of residency Twitter accounts and 73.8% of residency Instagram accounts were created after March 1st, 2020.

4.2. Virtual events and announcements by platform

Of the neurology residency programs evaluated, 47% offered at least one virtual informational event. Table 1 shows which platforms were used by programs to announce virtual opportunities online. Programs favored Twitter and Instagram (32.1% and 31.4% of programs, respectively) over their residency website and Facebook (8.8% and 11.9% of programs, respectively) to advertise such opportunities.

4.3. Virtual and traditional sub-internships and electives on VSAS

Only 2 (1.3%) programs offered virtual sub-internships or electives on VSAS for the 2020–2021 year, with a total of 2 opportunities. Traditional sub-internships and electives were still advertised by 47 (29.6%) programs, with 102 total opportunities.

4.4. Presence and number of social media accounts relative to program prestige

Fig. 3 displays trends in social media account presence and number in relation to program quartiles based on program prestige. A strong correlation exists between program quartile and presence of at least one social media account (R^2 = 0.93) as well as between program quartile and absolute number of social media accounts (R^2 = 0.97).

5. Discussion

In 2020, the spread of COVID-19 led to many limitations on how neurology residency programs and applicants were able to interact, such as the inability of applicants to participate in away rotations and attend in-person interviews. In this study, we looked at how neurology residency programs utilized virtual modes of communication to adapt to these novel restrictions.

Our findings demonstrate an increase in neurology residency social media accounts after the COVID-19 outbreak. Particularly, residency program accounts drastically increased on Twitter and Instagram (Fig. 1). Instagram became home to the highest number of residency program accounts during the COVID-19 pandemic, a spot previously held by Facebook (Fig. 1). Number of department accounts increased as well, although this change was less notable than residency program account growth (Fig. 2). An additional variable assessed in this study was the presence of virtual informational events and which online platforms were used to advertise them in 2020. Almost half of the neurology residency programs announced at least one online virtual event via their website or social media. Notably, programs preferred to announce and advertise these events on Instagram and Twitter more than their residency program website or Facebook (Table 1). Taken altogether, these findings suggest that the COVID-19 outbreak led to an
increased use of Instagram and Twitter by neurology residency programs, not only to connect with applicants but also to announce virtual opportunities. Therefore, we recommend that neurology residency applicants create professional accounts on Twitter and Instagram in order to better network with residency programs as the shift towards online communication will likely continue in the coming years. Similarly, we feel that more neurology residency programs should consider utilizing social media in order to better serve applicants by fielding questions and providing program information and open house opportunities.

Going forward, consideration of an online model for residency applications could be beneficial for applicants and programs if both parties are able to meet their goals with fewer expenditures. Reduced costs may manifest most distinctly in the interview process. In 2015, the AAMC released a report breaking down the cost of applying to residency, in which the average expense of a residency applicant was found to be $3422.71 $2916 per applicant. Of all respondents, 58% reported that finances influenced their decisions to attend interviews. Though decreased cost of online interviews would allow applicants to apply more broadly, complete transition to virtual interviews would limit program-applicant facetime and raise concerns for adequate evaluation of applicants by programs and vice versa. Therefore, we anticipate neurology residency programs will continue to utilize online platforms primarily as a supplement to traditional interviews rather than a full replacement once COVID-19 restrictions are lifted.

Only 2 programs had virtual opportunities available on VSAS, indicating that neurology programs did not commonly use this channel as a means of adapting to travel restrictions for the 2020–2021 application cycle. This may be explained by a lack of fit of virtual rotations for neurology. Educational content such as the neurology physical exam could be difficult to transition to an online platform. Additionally, away rotations are not highly sought after by neurology applicants compared with other specialties. In 2019, for example, only 41.2% of graduating medical students who intended to apply into neurology participated in an away rotation during medical school, compared to nearly 100% away rotation participation rates typically seen in other specialties such as plastic surgery, dermatology, and neurosurgery, among others [3,11]. Students who are interested in away rotations for neurology should

**Table 1**
Number of programs that announced virtual events on each platform.

| Programs with Virtual Events | Residency Website | Twitter | Instagram | Facebook |
|-----------------------------|-------------------|---------|-----------|----------|
| 14 (8.8%)                   | 51 (32.1%)        | 50 (31.4%) | 19 (11.9%) |
consider traditional, in-person electives and sub-internships, as many programs are offering these opportunities in 2021.

We found a strong correlation between program prestige and the presence and number of social media accounts the program had across all platforms (Fig. 3). We believe there are a few possible explanations for this finding. Generally, prestige is based on various factors, such as NIH funding, research output, and the number of residents that go on to pursue a fellowship. Therefore, more prestigious programs may have more resources for creating and maintaining social media accounts. Additionally, students at more prestigious programs may have greater program pride and would be more likely to participate in the promotion of their program on social media. Applicants interested in more prestigious programs may have additional incentive to create professional social media accounts for networking.

Limitations of this study include its retrospective nature. As the response to COVID-19 is a developing situation, data is constantly changing, with new social media accounts and virtual opportunities being created and advertised in an ongoing fashion.

6. Conclusion

The COVID-19 pandemic restricted in-person communication between residency programs and applicants. One way neurology residency programs adapted was by creating residency social media accounts on Instagram and Twitter and hosting virtual informational events. Programs modified their use of Facebook and residency program websites to a lesser degree, and only a very small number of programs offered virtual sub-internships and electives through VSAS. Virtual informational events were most often announced on Instagram and Twitter. More prestigious programs were more likely to have both a presence on social media and a higher number of social media accounts. In our opinion, it is in the best interest of neurology residency applicants to create professional Instagram and Twitter accounts to network with neurology residency programs moving forward, especially if applicants are interested in applying to prestigious programs. Likewise, all neurology residency programs should consider utilizing social media for additional communication with applicants. Students interested in away rotations for neurology should consider traditional electives and sub-internships as many opportunities are available in 2021.

Credit authorship contribution statement

Rahul Gaini: Conceptualization, Methodology, Investigation, Data curation, Writing - original draft, Writing - review & editing, Visualization, Supervision, Project administration. Kush Patel: Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft, Writing - review & editing, Visualization. Saad Khan: Conceptualization, Methodology, Investigation, Writing - original draft, Writing - review & editing, Visualization. Nikhi Singh: Conceptualization, Methodology, Writing - review & editing. Marissa Natelson Love: Writing - review & editing, Supervision.

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