

# Increased social media utilization and content creation by cardiothoracic surgery programs during the coronavirus disease 2019 pandemic



Mohamed Gadelkarim, MD, Layan Alrahmani, MD, Celsa Tonelli, MD, Richard Freeman, MD, MBA, Wissam Raad, MD, James Lubawski, Jr, MD, Wickii T. Vigneswaran, MD, MBA, and Zaid M. Abdelsattar, MD, MS

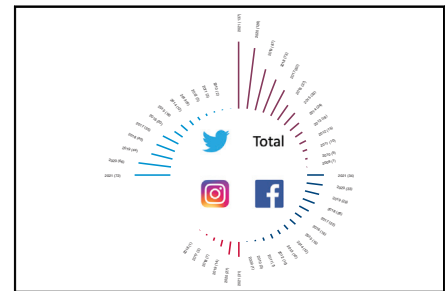
## ABSTRACT

**Objectives:** The coronavirus disease 2019 (COVID-19) pandemic has changed the landscape of professional activities, emphasizing virtual meetings and social media (SoMe) presence. Whether cardiothoracic programs increased their SoMe presence is unknown. We examined SoMe use and content creation by cardiothoracic surgery programs during the COVID-19 pandemic.

**Methods:** We searched the Accreditation Council for Graduate Medical Education to identify all cardiothoracic surgery residency programs ( $n = 122$ ), including independent ( $n = 74$ ), integrated ( $n = 33$ ), and congenital ( $n = 15$ ) training programs at 78 US cardiothoracic surgery teaching institutions. We then manually searched Google, Facebook, Instagram, LinkedIn, and Twitter to identify the associated residency and departmental accounts. The timeline for our search was between 10/2021 and 4/2022. March 2020 was used as the starting point for the COVID-19 pandemic. We also contacted the account managers to identify account content creators. The data are descriptively reported and analyzed.

**Results:** Of 137 SoMe accounts from 78 US cardiothoracic surgery teaching institutions, 72 of 137 (52.6%) were on Twitter, 34 of 137 (24.8%) on Facebook, and 31 of 137 (22.6%) on Instagram. Most accounts were departmental accounts (105/137 = 76.6%) versus 32 of 137 (23.4%) training program accounts. Most training program-specific SoMe accounts across all platforms were created after the COVID-19 pandemic, whereas departmental accounts were pre-existing ( $P < .001$ ). The most pronounced SoMe growth was on Instagram at the training program level, with 91.7% of Instagram accounts created after the pandemic. Trainees are the content creators for 94.4% of residency accounts and 33.3% of departmental accounts. Facebook's presence was stagnant. Congenital training programs did not have a specific SoMe presence.

**Conclusions:** SoMe presence by cardiothoracic surgery training programs and departments has increased during the pandemic. Twitter is the most common platform, with a recent increased trend on Instagram. Trainees largely create content. SoMe education and training pathways may be needed for involved trainees to maximize their benefits. (JTCVS Open 2022;12:315-28)



Social media platform utilization over time.

## CENTRAL MESSAGE

Social media presence by cardiothoracic surgery training programs and departments has increased during the pandemic. Social media content is largely created by trainees.

## PERSPECTIVE

Social media presence by cardiothoracic surgery training programs and departments has increased during the pandemic. Twitter is the most common platform, with a recent increased trend on Instagram. Trainees largely create content. Social media education and training pathways may be needed for involved trainees to maximize their benefits.

From the Department of Thoracic & Cardiovascular Surgery, Loyola University Medical Center, Maywood, Ill.

Received for publication May 3, 2022; revisions received Sept 15, 2022; accepted for publication Sept 19, 2022; available ahead of print Oct 25, 2022.

Address for reprints: Zaid M. Abdelsattar, MD, MS, Loyola University Medical Center, 2160 S 1st Ave, Maywood, IL 60153 (E-mail: [Zaid.Abdelsattar@lumc.edu](mailto:Zaid.Abdelsattar@lumc.edu)). 2666-2736

Published by Elsevier Inc. on behalf of The American Association for Thoracic Surgery. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.jxon.2022.09.004>

Several studies have highlighted the role of social media in scientific dissemination, networking, and opening doors for academic opportunities.<sup>1,2</sup> The coronavirus disease 2019 (COVID-19) pandemic imposed several restrictions on many day-to-day activities within residency programs and departments, including thoracic surgery.<sup>3,4</sup> Most programs suspended in-person interviews and shifted toward virtual interviews for their respective residency match.<sup>5</sup> Although these platforms were safe alternatives for in-person

### Abbreviations and Acronyms

ACGME = Accreditation Council for Graduate Medical Education  
 COVID-19 = coronavirus disease 2019

interviews, they impacted the abilities of program directors to assess candidate interpersonal skills and for candidates to assess crucial factors in residency programs such as a program's fit, place, and character.<sup>6</sup> To circumvent this, there were significant increases in social media use among candidates and surgical residency programs during the COVID-19 era across different specialties, including dermatology, general surgery, neurology, orthopedic surgery, otolaryngology, pediatric, and urology residency programs in 2020 compared with previous years.<sup>7-11</sup>

It is unknown whether cardiothoracic surgery departments or training programs have adopted a greater social media presence. The effect of the COVID-19 pandemic as a catalyst for cardiothoracic programs has not been examined. Cardiothoracic surgery training programs are generally smaller in complement and have substantial differences in terms of workload compared with other specialties. In addition, within cardiothoracic surgery, there are several training pathways and accredited subspecialties. Thus, a better understanding of social media trends among these different training pathways is needed.

In this context, we assessed how cardiothoracic surgery residency programs used social media platforms before and after the pandemic. Specifically, we examined the trends for independent training programs, integrated programs, and congenital fellowship programs, in addition to department-level use. We also assessed the parties responsible for content creation. The findings can help guide programs using the most trending platforms, maximize reach, and provide training and education for content creators.

## METHODS

### Data Collection

We searched the Accreditation Council for Graduate Medical Education (ACGME) to identify all cardiothoracic surgery residency programs, including independent ( $n = 74$ ), integrated ( $n = 33$ ), and congenital ( $n = 15$ ) training programs at 78 US teaching institutions. We then manually searched Google, Facebook, Instagram, and Twitter to identify the associated training and departmental accounts. We accessed the programs' official websites and their department and residency social media accounts on Twitter, Facebook, and Instagram. We excluded unofficial private or personal accounts. The timeline for our search was between October 2021 and April 2022. All data and accounts are public; therefore, the study was deemed exempt from the Loyola University Chicago Institutional Review Board.

We standardized nomenclatures by defining a department account as the account dedicated to the department of cardiothoracic surgery or department of surgery of the given institution. The residency account is the one

dedicated to the cardiovascular and thoracic surgery residency program at a respective institution. For Twitter, the account creation date is publicized in the biographical section. For Instagram, it is not publicized; however, we estimated the account's creation date as the first post's date. Finally, for Facebook, the date of creating the account is present in the page transparency section. Accounts were classified as created before or after March 1, 2020, which denotes an account created pre- or post-COVID-19 pandemic.

We included accounts for independent, integrated, and congenital cardiothoracic surgery programs. If the account was devoted to cardiothoracic surgery and other surgical specialties, we only counted accounts with information related to cardiothoracic surgery. We searched the visiting student application services for virtual subinternship and the history of each included account in the study for posts announcing hiring for candidates, live virtual open houses, virtual subinternship opportunities, or interactive meetings. We excluded informational videos, video tours, and noninteractive posts and then counted the number of available virtual opportunities per social media account/page. For estimating the number of tweets per month in 2019 and 2020, we used the web-based service "Tweetstats.com."<sup>12</sup>

Most of the social media accounts did not specify the type of the program, whether it was independent, congenital, or integrated. In other words, some accounts covered more than 1 program type in the same institution. We considered the programs that belong to the same cardiothoracic teaching institution and have one nonspecific account as one program.

To clarify who creates content for the social media account, we surveyed 128 of 137 accounts by sending them a direct query on each respective social media platform. Nine accounts already announced who runs their account, so those programs were not queried.

Finally, we identified a program director for each program using the ACGME to estimate the use of social media by program directors. We searched program directors' accounts on LinkedIn, Twitter, Facebook, and Instagram. We considered a program director using social media if they had a presence on any of those platforms.

### Statistical Analysis

Data are presented as medians and ranges for scaled data and percentages for nominal data. Statistical analyses included the  $\chi^2$  test, which was used for categorical variables, and Wilcoxon rank-sum test for continuous variables, as appropriate. All statistical tests were 2-sided. All data were analyzed using SPSS, version 25 (IBM Corp), and RevMan manager, version 5.4.1 (Cochrane), program. [Table E1](#) lists all accounts and handles.

## RESULTS

### Overview

One hundred twenty-two thoracic surgery programs were identified from the ACGME database. There were 74 independent, 33 integrated programs, and 15 congenital at the 78 US teaching institutions. Of 137 social media accounts from the 78 US cardiothoracic surgery teaching institutions, 72 of 137 (52.6%) were on Twitter, 34 of 137 (24.8%) on Facebook, and 31 of 137 (22.6%) on Instagram. Most accounts were departmental accounts (105/137 = 76.6%) versus 32 of 137 (23.4%) training program accounts. Congenital cardiac surgery fellowships did not have any social media presence at the time of data collection.

Most training program-specific social media accounts across all platforms were created after the COVID-19 pandemic (25/32 = 78.1%) ( $P < .001$ ), whereas most departmental accounts were created before the pandemic

(85/105 = 81%) ( $P < .001$ ). The most pronounced social media growth was in Instagram at the training program level, as 91.7% of Instagram accounts were created after the pandemic. Across all platforms, 32.8% of all accounts were created after March 1, 2020. About 16.4% of the programs announced cardiothoracic surgery residence/fellowship virtual open house on different social media platforms or official websites; however, virtual sub-internships were not found.

Of note, all programs had representative websites that were easily identifiable by a Google search. Eighty-seven of 122 programs (71.3%) had social media accounts for the program director. There were 95 program directors for 122 programs, and 74.7% of program directors had some form of personal social media presence across platforms.

The content creation survey response rate was 20.9% for a total of 36 accounts with information on content creators. Trainees managed or comanaged content creation in 63.9% of all social media accounts. Specifically, trainees managed or comanaged content creation for 94% of the training program’s social media accounts, whereas 66.7% of departmental-level accounts’ social media content was managed by a communication professional from the media department, marketing team, or program administrator.

**Twitter**

There were 72 Twitter accounts; 55 were departmental level accounts, and 17 were training program accounts, as shown in Table 1. Most training program Twitter accounts were created after the pandemic,  $P = .004$  (Figure 1). The median number of residency accounts’ tweets per month (based on available data from 133 accounts) increased significantly after the pandemic from 0 (range, 0.3-31.1

tweets) to 4 (range, 0-14.9 tweets);  $P = .005$  (Table 1). Trainees managed content creation for all Twitter training program accounts, and 68.2% of all Twitter accounts responded to the survey.

**Instagram**

Thirty-one accounts were identified on Instagram: 19 were departmental, and 12 were training program accounts (Table 2). Most training program Instagram accounts were created after the pandemic ( $P = .001$ ). Trainees managed content creation of 80% of training programs’ Instagram accounts and 75% of all Instagram accounts.

**Facebook**

Thirty-four accounts were identified on Facebook: 3 residency accounts and 31 department accounts (Table 3). There was no significant change in the number of residency accounts number, before or after the pandemic ( $P = .42$ ) (Figure 1 and Table 3). Trainees created content for 33% of all Facebook accounts.

**DISCUSSION**

In this first study assessing the use of social media platforms by academic cardiothoracic surgery programs during the COVID pandemic, we found that (1) most academic cardiothoracic surgery programs have at least 1 social media platform, with Twitter being the most common; (2) social media presence by cardiothoracic surgery training programs and departments has increased during the pandemic, and that (3) trainees largely manage content on cardiothoracic social media accounts. The findings have several relevant implications.

With the COVID-19 pandemic, in-person interviews, hospital tours, preinterview mixers, and social breaks have been replaced by one virtual interview, losing the social aspect of the interview and, along with it, the “gut feeling” that a program is right for the residency or fellowship candidate. Digital presence comes in many forms, and it is important for programs to have up to date social media and websites to highlight their faculty and trainees, and attract candidates.<sup>13-15</sup> Recent studies have highlighted how redesigned training program websites can help showcase what training programs have to offer.<sup>13-15</sup> In the eyes of candidates, social media is one aspect of bridging the gap and replacing some of the social element that is lost behind the screen.<sup>16</sup> While training program social media accounts are meant to attract potential future trainees, departmental accounts tend to attract a different following—primarily potential patients and employees.

Our study showed that Instagram accounts for training programs saw the most growth recently, and most accounts were created after the pandemic. A similar trend was seen in other specialties in recent years.<sup>5,7,8,17</sup> Instagram is viewed as the most highly engaged social platform, and users

**TABLE 1. Twitter descriptive statistics for the cardiothoracic surgery programs**

Parameter	Before March 2020, total no. (%)	After March 2020, total no. (%)	P value
Residency	4 (23.5%)	13 (76.5%)	.004
Department	44 (80%)	11 (20%)	<.001
Total	48 (66.7%)	24 (33.3%)	<.001
Number of tweets, median (range)			
Residency	0 (0-14.9)	4 (0.3-31.1)	.005
Department	16.9 (0-140.5)	20.25 (0-458.9)	.265
Independent			
Residency	10 (71.4%)	4 (28.6%)	.04
Department	10 (18.5%)	44 (81.5%)	<.001
Total	20 (29.4%)	48 (70.6%)	<.001
Integrated			
Residency	3 (100%)	0 (0%)	.07
Department	1 (100%)	0 (0%)	.34
Total	4 (100%)	0 (0%)	.04

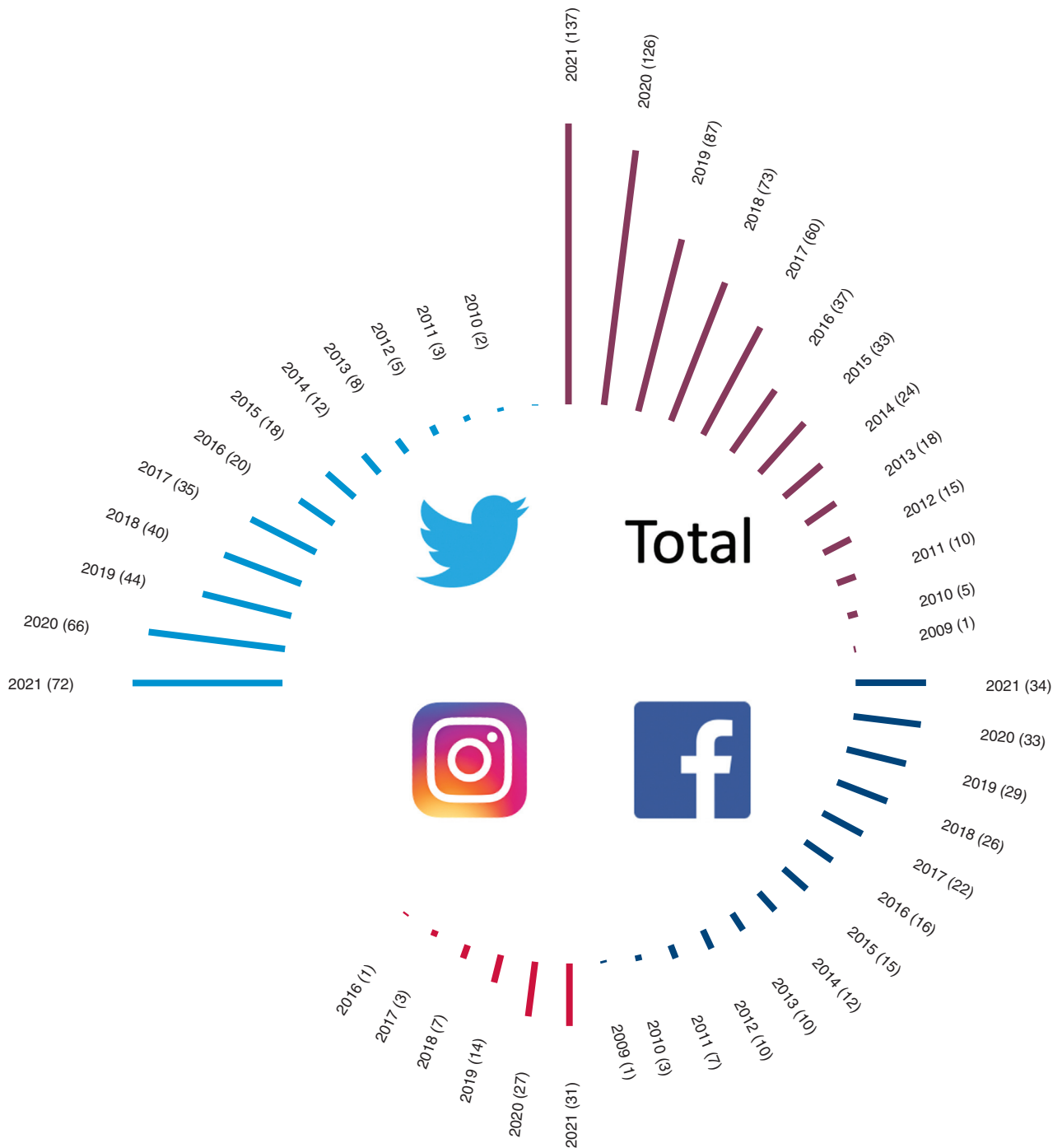


FIGURE 1. Social media use by cardiothoracic surgery program across platforms over time as measured by new accounts created.

regularly interact with posts, whereas Twitter is the least engaged platform. Forty percent of adults use Instagram, about double that of Twitter.<sup>18</sup> So, although the largest increase in social media use noted in this study was on Instagram, the most commonly used social media platform by cardiothoracic surgery residency programs overall was Twitter. Twitter is used by 22% of the US population, and

one study shows that Twitter users, on average, have a greater level of education than the general public.<sup>19</sup> It is a platform that is generally preferred by professionals in the medical field as a means of networking, circulating research, advocacy, and showing one’s accomplishments. In one study evaluating the use of Twitter among residency applicants, the majority of applicants reported using the

**TABLE 2. Instagram descriptive statistics for the cardiothoracic surgery programs**

Parameter	Before March 2020, total no. (%)	After March 2020, total no. (%)	P value
Residency	1 (8.3%)	11 (91.7%)	.001
Department	14 (73.7%)	5 (26.3%)	.005
Total	15 (48.4)	16 (51.6%)	.80
Independent			
Residency	9 (100%)	0 (0%)	.003
Department	5 (26.3%)	14 (73.6%)	.005
Total	14 (50%)	14 (50%)	.11
Integrated			
Residency	2 (66.7%)	1 (33.3%)	.42
Department	0	0	NA
Total	2 (66.7%)	1 (33.3%)	.42

NA, Not applicable.

platform to gain information about residency programs.<sup>20</sup> The recent rise in Instagram use is likely a reflection of the current generational makeup of current trainees and prospective candidates. Instagram does not have the character limitations of Twitter, relies on visual media such as pictures and videos rather than text, and may be more useful to showcase the social aspects of a training program. However, a direct comparison of the platform preferences between academic programs versus the general population is not possible.

The results demonstrate how cardiothoracic training programs increased social media presence during the pandemic. We hypothesize this was to maximize the outreach for candidates and highlight critical areas for future direction. Since the start of the COVID-19 pandemic, medical education and the process of the medical residency

**TABLE 3. Facebook descriptive statistics for the cardiothoracic surgery programs**

Parameter	Before March 2020 total no. (%)	After March 2020 total no. (%)	P value
Residency	2 (66.7%)	1 (33.3%)	.42
Department	27 (87.1%)	4 (12.9%)	<.001
Total	29 (85.3%)	5 (14.7%)	<.001
Independent			
Residency	1 (33.3%)	2 (66.7%)	.16
Department	3 (10.3%)	26 (89.7%)	<.001
Total	4 (12.5%)	28 (87.5%)	<.001
Integrated			
Residency	0	0	–
Department	1 (50%)	1 (50%)	.999
Total	1 (50%)	1 (50%)	.999

program application cycle have dramatically changed. Zoom meetings, virtual interviews, online teaching, and telehealth are the norm nowadays. Our results showed a significant “surge” in residency accounts created and residency accounts’ tweets posted after March 2020, coinciding with the initial period of the COVID pandemic. Similarly, these findings were parallel to other specialties’ findings on social media usage.<sup>5,7,8</sup> That being said, it is difficult to confidently ascertain whether the pandemic directly caused the increase in social media presence. Extrapolating from business models, adoption of new technology follows an S curve with 4 stages: initial slow growth, rapid growth, late-stage slow growth, and stationary demand. Whether the year of the pandemic just happened to coincide with the stage of rapid growth, or did the pandemic itself shift the curve for an earlier rapid growth stage is not certain. We favor the latter, as we believe that the pandemic may have served as a catalyst for social media adoption.

Other benefits of social media should not be overlooked. Corsini and colleagues<sup>2,21</sup> highlighted the little-talked-about benefits of social media for underrepresented minorities, specifically for women in surgery, in networking, sponsorship and mentorship. Women remain a minority in surgical fields, and women surgeons often report that lack of mentorship is a prominent barrier for career selection. Mentorship and networking for women physicians through social media has been found to be successful and highly desired by mentees in cardiothoracic surgery as well as other medical fields.<sup>22,23</sup> Social media and other virtual platforms help to bridge the gap and connect individuals who may not have in-person opportunities.

One key finding from the present study is the fact that trainees manage almost all training program social media platforms and a large number of department accounts, keeping in mind that in some instances, the departmental accounts include the training program accounts and there is no separation of accounts. That is concerning because medical training lacks social media training. Another concern is that trainees likely do not get protected time nor reimbursement for their time spent on work-related social media matters. When the lines are blurred, there is room for error, unprofessional behavior, and Health Insurance Portability and Accountability Act violations.<sup>24</sup> Portraying a professional online persona while demonstrating the enjoyable and humane aspect of residency to prospective candidates and the rest of the world is not a simple task. Social media is a powerful tool that can have many benefits when used properly. However, it can be a double-edged sword. Improper use of social media has led to retracted peer-reviewed papers and even termination of employment.<sup>25-27</sup> Providing trainees proper training in social media and adequate ancillary support to do it is needed. Social media training has been shown to decrease inappropriate or unprofessional online behavior.<sup>28</sup>



Although we all agree that doctors are human and they make mistakes, the reality is that doctors are held to a higher standard in the eyes of their colleagues and the public.<sup>28-31</sup> To mitigate this, several medical associations, such as the American Medical Association and American Medical Student Association, have published material on social media etiquette.<sup>32</sup> There are also ethical standards in social media participation published specifically pertaining to cardiothoracic surgery, and we suggest its incorporation into the residency curriculum.<sup>33</sup>

This study has several limitations. First, this is an observational study of publicly accessible accounts. It is unknown whether there are private accounts that some programs send specific invites to medical students or interview candidates. Second, given the rapidly growing nature of social media that could cause chronologically dependent variability, we are limited by the events and programs up to the “last accessed date” of each account by this study’s authors. Some platforms, such as Instagram, have time-limited features or vanishing content, and therefore we have no access to that if it was created in the past. Moreover, we do not have data on the social media accounts of prospective candidates, nor of individual faculty accounts that post or tweet on behalf of their institutions if there are institutional restrictions on departmental account creation. Finally, a report on the actual individual content of tweets and posts is beyond the scope of this paper. As such, we are unable to assess the intent of the increase of social media presence, nor are we able to estimate whether this increased utilization was more effective in terms of candidate recruitment. Notwithstanding these limitations, we believe the results are timely and essential for trainees and training programs to be aware of to find and provide the most relevant information on these rapidly expanding platforms.<sup>34</sup>

In this study, we viewed the increased social media presence as a positive, and that programs have “adapted” to the constraints of the pandemic. It would be prudent to balance the discussion with an opposing view, mentioning the potential negative effects of social media. These include digital overload, peer pressure, unrealistic expectations by candidates about programs or the fear of missing out (ie, “FOMO”), and trainee distraction. Indeed, several strategies of mental wellbeing include digital minimalism. These should be taken into consideration when analyzing the impact of social media.

In conclusion, cardiothoracic surgery training programs and departments have adapted to the COVID-19 pandemic by increasing their social media presence, particularly on Instagram. Social media presence is largely driven and managed by trainees. Cardiothoracic training programs should invest in their social media presence to maximize their virtual reach and develop social media education and training pathways for involved trainees and faculty. Even

as we emerge from the pandemic, social media is here to stay, and residency programs and departments will have to continue to adapt to the changing digital world. This generation will also soon become our patients, and being able to speak their language is an essential part of increasing trust in health care.

### Conflict of Interest Statement

The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

### References

1. Luc JGY, Archer MA, Arora RC, Bender EM, Blitz A, Cooke DT, et al. Social media improves cardiothoracic surgery literature dissemination: results of a randomized trial. *Ann Thorac Surg.* 2020;109:589-95. <https://doi.org/10.1016/j.athoracsur.2019.06.062>
2. Corsini EM, Luc JGY, Antonoff MB. Women in thoracic surgery: social media and the value of mentorship. *J Thorac Dis.* 2021;13:464-72. <https://doi.org/10.21037/jtd.2020.04.11>
3. Luc JGY, Archer MA, Arora RC, Bender EM, Blitz A, Cooke DT, et al. The thoracic surgery social media network experience during the COVID-19 pandemic. *Ann Thorac Surg.* 2020;110:1103-7. <https://doi.org/10.1016/j.athoracsur.2020.05.006>
4. Giordano L, Cipollaro L, Migliorini F, Maffulli N. Impact of Covid-19 on undergraduate and residency training. *Surgeon.* 2021;19:e199-206. <https://doi.org/10.1016/j.surge.2020.09.014>
5. Coalition for physician accountability releases recommendations on 2021-22 residency season interviewing. The match, national resident matching program. Accessed September 22, 2022. <https://www.nrmp.org/coalition-recommendations-2021-22-interviewing/>
6. Klammer RM, Haydel MJ, Gallahue F, Bruno EC, Langdorf MI, Cheaito MA, et al. Program visits and residency interviews. *J Emerg Med.* 2019;57:e133-9. <https://doi.org/10.1016/j.jemermed.2019.04.028>
7. Yong TM, Pappas MA, Ray GS, McManus TG, Coe MP. Analyzing the proliferation of social media use among orthopaedic surgery residency programs. *JB JS Open Access.* 2021;6:e21.00017. <https://doi.org/10.2106/JBJS.OA.21.00017>
8. Ho P, Margolin E, Sebesta E, Small A, Badalato GM. #AUMatch: the impact of COVID-19 on social media use in the urology residency match. *Urology.* 2021;154:50-6. <https://doi.org/10.1016/j.urology.2021.05.019>
9. Gaini RR, Patel KM, Khan SA, Singh NP, Love MN. A rise in social media utilization by U.S. neurology residency programs in the era of COVID-19. *Clin Neurol Neurosurg.* 2021;207:106717. <https://doi.org/10.1016/j.clineuro.2021.106717>
10. Clay Pruett J, Deneen K, Turner H, Kozar T, Singh NP, King TW, et al. Social media changes in pediatric residency programs during COVID-19 pandemic. *Acad Pediatr.* 2021;21:1104-7. <https://doi.org/10.1016/j.acap.2021.06.004>
11. Fang HA, Boudreau BS H, Khan S, Singh NP, Rais-Bahrami S, King TW, et al. An evaluation of social media utilization by general surgery programs in the COVID-19 era. *Am J Surg.* 2021;222:937-43. <https://doi.org/10.1016/j.amjsurg.2021.04.014>
12. Tweet stats. Accessed January 8, 2022. <https://new.tweetstats.com/>
13. Nelson DB, White PT, Rajaram R, Antonoff MB. Showcasing your cardiothoracic training program in the virtual era. *Ann Thorac Surg.* 2021;111:1102-10. <https://doi.org/10.1016/j.athoracsur.2021.01.022>
14. Rajaram R, Abreu JA, Mehran R, Nguyen TC, Antonoff MB, Vaporciyan A. Using quality improvement principles to redesign a cardiothoracic surgery fellowship program website. *Ann Thorac Surg.* 2021;111:1079-85. <https://doi.org/10.1016/j.athoracsur.2020.05.158>
15. Miller VM, Padilla LA, Schuh A, Mauchley D, Cleveland D, Aburjania Z, et al. Evaluation of cardiothoracic surgery residency and fellowship program websites. *J Surg Res.* 2020;246:200-6. <https://doi.org/10.1016/j.jss.2019.09.009>

16. Renew JR, Ladlie B, Gorlin A, Long T. The impact of social media on anesthesia resident recruitment. *J Educ Perioper Med*. 2019;21:E632.
17. Kim YH, Ali NS, Vidal NY. Social media use in residency recruitment during the COVID-19 pandemic. *Dermatol Online J*. 2021;27. <https://doi.org/10.5070/D327654053>
18. Social media use in 2021. Pew research center: internet, science & tech. Accessed September 22, 2022. <https://www.pewresearch.org/internet/2021/04/07/social-media-use-in-2021/>
19. How twitter users compare to the general public. Pew research center: internet, science & tech. Accessed September 22, 2022. <https://www.pewresearch.org/internet/2019/04/24/sizing-up-twitter-users/>
20. Friedman BJ, Chen I, Asantey K, Loeb S, Kim SP, Malik RD, et al. Twitter engagement of medical students applying to urology residency during COVID-19: a mixed methods study. *Urology*. 2022;165:120-7. <https://doi.org/10.1016/j.urology.2021.11.046>
21. Corsini EM, Boeck M, Hughes KA, Logghe HJ, Pitt SC, Stamp N, et al. Global impact of social media on women in surgery. *Am Surg*. 2020;86:152-7.
22. Luc JGY, Stamp NL, Antonoff MB. Social media as a means of networking and mentorship: role for women in cardiothoracic surgery. *Semin Thorac Cardiovasc Surg*. 2018;30:487-95. <https://doi.org/10.1053/j.semtevs.2018.07.015>
23. Ernst M, Badkshan S. #UroStream101: social media as a medium for mentorship in urology. *Urology*. 2021;158:39-44. <https://doi.org/10.1016/j.urology.2021.08.001>
24. 15+ real-world examples of social media HIPAA violations—etactics. Accessed January 8, 2022. <https://etactics.com/blog/social-media-hipaa-violations>
25. Ventola CL. Social media and health care professionals: benefits, risks, and best practices. *P T*. 2014;39:491-520.
26. A Washington ER doctor was allegedly terminated after publicly criticizing his hospital for not protecting its staff. Time. Accessed September 22, 2022. <https://time.com/5812006/washington-coronavirus-health-care-staff-fired/>
27. Hardouin S, Cheng TW, Mitchell EL, Rauli SJ, Jones DW, Siracuse JJ, et al. Prevalence of unprofessional social media content among young vascular surgeons. *J Vasc Surg*. 2020;72:667-71 [retracted article].
28. What's up, doc? Emergency room doctor fired for posting photos on Facebook. TLNT. Accessed September 22, 2022. <https://www.tlnt.com/whats-up-doc-emergency-room-doctor-fired-for-posting-photos-on-facebook/>
29. Professionalism in the use of social media. American medical association. Accessed January 8, 2022. <https://www.ama-assn.org/delivering-care/ethics/professionalism-use-social-media>
30. How social media can aid medical residency program searches. American Medical Association. Accessed January 8, 2022. <https://www.ama-assn.org/residents-students/residency/how-social-media-can-aid-medical-residency-program-searches>
31. Kilic Y, Chauhan D, Avery P, Horwood N, Nakov R, Disney B, et al. The public's attitude towards doctors' use of Twitter and perceived professionalism: an exploratory study. *Clin Med (Lond)*. 2021;21:e475-9. <https://doi.org/10.7861/clinmed.2021-0357>
32. Social media guidelines for medical students and physicians. AMSA. Accessed September 22, 2022. <https://www.amsa.org/social-media-guidelines-medical-students-physicians-2/>
33. Varghese TK Jr, Entwistle JW III, Mayer JE, Moffatt-Bruce SD, Sade RM; Cardiothoracic Ethics Forum. Ethical standards for cardiothoracic surgeons' participation in social media. *Ann Thorac Surg*. 2019;108:666-70. <https://doi.org/10.1016/j.athoracsur.2019.04.003>
34. McHugh SM, Shaffer EG, Cormican DS, Beaman ST, Forte PJ, Metro DG. Use of social media resources by applicants during the residency selection process. *J Educ Perioper Med*. 2014;16:E071.

**Key Words:** social media, cardiothoracic surgery, residency, program directors

TABLE E1. List of institutions and training programs with their respective social media accounts

Educational institution and program type	Twitter	Instagram	Facebook	Program director	Program director's SoMe platform
University of Alabama Medical Center Independent	UABSurgery			Wei	LinkedIn
University of Arizona College of Medicine-Tucson Independent	UofAZSurgery	uofazsurgery	UAsurgery	Fox	LinkedIn
UCLA David Geffen School of Medicine Independent	UCLASurgery			Shemin	Twitter
University of California (San Francisco) Independent	UCSFSurgery	ucsfsurgery	SurgeryFresnoUCSF	Kratz	LinkedIn
Stanford Health Care-Sponsored Stanford University Independent Integrated Congenital	StanfordCTSurg	stanfordctsurg	StanfordSurgery	Fischbein Fischbein Mainwaring	LinkedIn
Loma Linda University Health Education Consortium Independent				Razzouk	LinkedIn
University of California (San Diego) Medical Center Independent	UCSDsurgery	humansofsurgery		Thistlethwaite	LinkedIn
University of California Davis Health Independent Integrated	UCDavisSurgery UcSurgery	ucdavissurgery	CardiothoracicSurgery	Cooke Raff	LinkedIn + Twitter
University of Southern California Independent Integrated Congenital	FightOnThoracic	usccardiacsurgery	USCCardiacSurgery	Baker Baker Cleveland	LinkedIn + Twitter LinkedIn + Twitter
Cedars-Sinai Medical Center Independent Integrated	DeptSurgeryCS			Cheng Cheng	
University of Colorado Independent Congenital	CUDeptSurg			Fullerton Jagers	LinkedIn
Educational institution and program type	Twitter	Instagram	Facebook	Program director	Program director's SoMe platform
Yale-New Haven Independent Integrated	YaleCardiacSurg yalectsurgery	yalectsurgery		Detterbeck Detterbeck	LinkedIn LinkedIn
University of Florida Independent Integrated	UFSurgery			Manning Manning	LinkedIn LinkedIn

(Continued)



TABLE E1. Continued

<b>Educational institution and program type</b>	<b>Twitter</b>	<b>Instagram</b>	<b>Facebook</b>	<b>Program director</b>	<b>Program director's SoMe platform</b>
University of Miami/ Jackson Health System Independent				Lamelas	LinkedIn + Twitter
Emory University School of Medicine Independent	EmoryCTSurgery	emorycardio thoracic surgery	EmoryCardiac Surgery Residency	Pickens	LinkedIn + Twitter
Integrated Congenital				Pickens Shashidharan	LinkedIn + Twitter LinkedIn
McGaw Medical Center of Northwestern University Independent	NM_Lung		Northwestern Medicine ThoracicSurgery ChicagoIL	Malaisrie	Twitter
Integrated Congenital				Malaisrie Monge	Twitter
Rush University Medical Center Independent	RushSurgery	rushctsurgery		Seder	LinkedIn
University of Chicago Independent	uchicagosurgery UChicagoCTSurg		UChicago Surgery	Ferguson	LinkedIn
Loyola University Medical Center Independent	LoyolaSurgery	loyolathoraciccv fellows		Perez-Tamayo	LinkedIn
Indiana University School of Medicine Independent	IU_Surgery	IU_surgery	Iusurgery	Lee	LinkedIn
Integrated				Lee	LinkedIn
<b>Educational institution and program type</b>	<b>Twitter</b>	<b>Instagram</b>	<b>Facebook</b>	<b>Program director</b>	<b>PD SoMe platform</b>
University of Iowa Hospitals and Clinics Independent	UIowa_Surgery	UIowa_surgery		Keech	LinkedIn
Integrated				Keech	LinkedIn
University of Kansas School of Medicine Independent	KU_Surgery		KUMedicalCenter Departmentof Surgery	Daon O'Brien	LinkedIn
Congenital					
University of Louisville School of Medicine Independent	UofL_cts		UofLCTSurgery	Slaughter	LinkedIn
University of Kentucky College of Medicine Independent	UKSurgeryDept ThoracicUk		UKCardiothoracic SurgeryClinic	Meyerson	Twitter
Integrated				Meyerson	Twitter

(Continued)

TABLE E1. Continued

Educational institution and program type	Twitter	Instagram	Facebook	Program director	PD SoMe platform
Ochsner Clinic Foundation Independent				Gaudet	LinkedIn
Johns Hopkins University Independent	HopkinsCTSurg				
University of Maryland Independent Independent Integrated	MarylandSurg MarylandCTSurg			Kilic Forbess Forbess	Twitter LinkedIn LinkedIn
Massachusetts General Hospital Independent Congenital	MGHSurgery	MGHthoracicsurgery MGHctsurgery		Morse Fynn-Thompson	LinkedIn LinkedIn
Beth Israel Deaconess Medical Center Independent	BIDMCSurgery			Gangadharan	LinkedIn + Twitter
Tufts Medical Center Independent				Chen	
Brigham and Women's Hospital Independent Integrated	BrighamThoracic			Jaklitsch Jaklitsch	Twitter Twitter
Educational institution and program type	Twitter	Instagram	Facebook	Program director	Program director SoMe platform
University of Michigan Health System Independent Integrated Congenital	UMichSurgery UMichCTSurgery	Michigan_surgery		Chang Chang Romano	Twitter
University of Minnesota Independent	UMNSurgery		Department-of-Surgery-University-of-Minnesota	Kelly	LinkedIn
Mayo Clinic Rochester Independent	MayoClinicCVS			Shen	LinkedIn
University of Mississippi Medical Center Independent	UMMCsurgery UMMC_ctsurgres	UMMC_ctsurgres	UMMCsurgery	de Delva	LinkedIn
Washington University/B- JH/SLCH Consortium Independent Congenital	WashU_CT UWCTSurgRes	WashUsurg	WashUSurgery	Puri Eghtesady	LinkedIn
University of Nebraska Medical Center Independent				Lackner	
Rutgers Health/Newark Beth Israel Medical Center Independent				Karanam	LinkedIn

(Continued)

TABLE E1. Continued

<b>Educational institution and program type</b>	<b>Twitter</b>	<b>Instagram</b>	<b>Facebook</b>	<b>Program director</b>	<b>Program director SoMe platform</b>
Memorial Sloan Kettering Cancer Center Independent	MSK_Thoracic			Huang	LinkedIn
Albany Medical Center Independent				Fabian	LinkedIn
New York Presbyterian Hospital (Cornell Campus) Independent Integrated	WCM_CTSurgery	WCMsurgery		Girardi Argenziano	LinkedIn
Icahn School of Medicine at Mount Sinai Independent Integrated	SHSSurgery	Sinaithoracic		Adams Boateng	
<b>Educational institution and program type</b>	<b>Twitter</b>	<b>Instagram</b>	<b>Facebook</b>	<b>Program director</b>	<b>Program director SoMe platform</b>
Oregon Health & Science University Independent	OHSUsurgery			Schipper	
Temple University Hospital Independent	TempleSurgery			Erkmen	
Penn State Milton S Hershey Medical Center Independent	PSU_Surgery			Reed	LinkedIn
University of Pennsylvania Health System Independent Integrated Congenital	pennsurgery	pennsurgery		Cevasco Cevasco Fuller	LinkedIn
UPMC Medical Education Independent Integrated	UPMC_CTSurgery	upmc_ctorsg		Schuchert Schuchert	LinkedIn LinkedIn
Allegheny Health Network Medical Education Consortium (AGH) Independent				McGregor	
Vanderbilt University Medical Center Independent	VUMCSurgRes			Nesbitt	
Methodist Hospital (Houston) Independent	HMethodistCV		HMSurgical Associates West	Reul	Twitter
Baylor University Medical Center Independent				DiMaio	LinkedIn
University of Texas Medical Branch Hospitals Independent	UTMB_CTSurgery			Lick	LinkedIn

(Continued)

TABLE E1. Continued

Educational institution and program type	Twitter	Instagram	Facebook	Program director	Program director SoMe platform
University of Texas MD Anderson Cancer Center/University of Texas Medical School at Houston Independent				Antonoff	LinkedIn + Twitter
Spectrum Health/Michigan State University Independent	MSU_Surgery		MSUsurgery	Spurlock	
Educational institution and program type	Twitter	Instagram	Facebook	Program director	Program director SoMe platform
Montefiore Medical Center/ Albert Einstein College of Medicine Independent Integrated				DeRose DeRose	LinkedIn LinkedIn
Zucker School of Medicine at Hofstra/Northwell Independent Integrated			LICTSurgeon	Manetta Manetta	LinkedIn LinkedIn
NYU Grossman School of Medicine Independent Integrated				Grossi Grossi	LinkedIn LinkedIn
University of Rochester Independent Integrated	URochesterSurg	urmc.ct. surgery	URMCSurgery residency	Peyre Peyre	LinkedIn LinkedIn
Vidant Medical Center Independent	ECUSurgery ECU_Thoracic		ECUSurgery	Speicher	LinkedIn
Wake Forest University School of Medicine Independent				Kincaid	
Duke University Hospital Independent Integrated Congenital	DukeCTSurgery		Dukesurgery	Haney Haney Turek	LinkedIn LinkedIn Twitter
Case Western Reserve University/University Hospitals Cleveland Medical Center Independent	UHCTSurgery			Linden	LinkedIn
Cleveland Clinic Foundation Integrated Independent  Congenital			Cleveland-Clinic-Thoracic-and-Cardiovascular-Surgery	Johnston Johnston  Karamlou	LinkedIn LinkedIn  LinkedIn

(Continued)

TABLE E1. Continued

Educational institution and program type	Twitter	Instagram	Facebook	Program director	Program director SoMe platform
Ohio State University Hospital Independent Integrated	OhioStateSurg			Mokadam Mokadam	LinkedIn + Twitter LinkedIn + Twitter
Educational institution and program type	Twitter	Instagram	Facebook	Program director	Program director SoMe platform
Texas Heart Institute/ Baylor College of Medicine Independent	BCM_Thoracic	BCM_surgery	BCMSurgery		
Baylor College of Medicine Integrated Congenital	BCM_CTSurgery	BCM_ctorsurgery		Coselli Coselli Caldarone	LinkedIn + Twitter LinkedIn + Twitter
University of Texas Southwestern Medical Center Independent	UTSW_Surgery		UTSWsurgery		Reznik Twitter
University of Utah Health Independent  Integrated	UofUSurgery		University of Utah Department of Surgery	Pereira  Pereira	LinkedIn + Twitter  LinkedIn + Twitter
University of Virginia Medical Center Independent Integrated	UVA_TCV_Surgery			Kern Kern	LinkedIn LinkedIn
Virginia Commonwealth University Health System Independent	VCU_Surgery		VCUsurgery		Shah LinkedIn
University of Washington Independent  Integrated Congenital	UWSurgery UWCTSurgRes	UWCTSurgery residents	UWDOS	Berfield  Berfield Permut	LinkedIn  LinkedIn LinkedIn
West Virginia University School of Medicine Independent	WVU_surgery				Cook LinkedIn
Medical College of Wisconsin Affiliated Hospitals, Inc Independent	MCWSurgery	mcwsurgery	MCWSurgery		Johnstone LinkedIn
University of Wisconsin Hospitals and Clinics Independent	WiscSurgery	Wiscsurgery	UW surgery		DeCamp LinkedIn
University of North Carolina Hospitals Integrated	UNCCTSurgery	UNC_CT_surgery	UNCSurgery		Haitcock Twitter

(Continued)



TABLE E1. Continued

Educational institution and program type	Twitter	Instagram	Facebook	Program director	Program director SoMe platform
Medical University of South Carolina Integrated	CT_MUSC	MUSCi6residency		Katz	LinkedIn + Twitter
University of Texas Health Science Center San Antonio Integrated	UTHealthSA_CTS		UTHealthSACTS		
		UTHealthSA_CTS		Carpenter	LinkedIn
University of Cincinnati Medical Center Independent Integrated Congenital	UCincyCTSurg	ucincinnati@surgery		Starnes Starnes Tweddell	LinkedIn + Twitter LinkedIn + Twitter LinkedIn

SoMe, Social media.