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Social Media Usage by United States Plastic Surgery Subspecialty Fellowship Programs

William M. Tian, BSE*
Amanda R. Sergesketter, MD†
Victoria N. Yi, BA*
J. Alexander Sizemore, BS*
Sydney M. Record, BA*
Steven L. Zeng, BA*
Brett T. Phillips, MD, MBA†

Background: Social media can be a powerful tool for plastic surgery training programs. Previous studies have shown the value social media may have in integrated residency program recruitment and program reputation. These findings may generalize to fellowship programs, but this space has not been comprehensively studied to date. Therefore, this study aims to characterize plastic surgery fellowship programs' social media usage and identify subsequent opportunities for program leadership to generate engagement.

Methods: United States plastic surgery fellowship programs in four major subspecialties (hand, microsurgery, craniomaxillofacial, and aesthetic) were identified and evaluated for social media presence on Instagram, Facebook, and Twitter. Platform-specific parameters were collected and statistically analyzed in aggregate.

Results: There were a total of 25 Instagram accounts, four Facebook accounts, and three Twitter accounts across all investigated subspecialties. Hand surgery had the greatest social media presence on Instagram (19.5%) and Twitter (3.4%). Microsurgery had the greatest presence on Facebook (4.7%). Between 2015 and 2022, Instagram was the platform with the greatest increase in adoption by fellowship programs. Geographically, microsurgery and craniomaxillofacial accounts were primarily owned by Midwest programs (66.7%, 100%), and aesthetic primarily by programs in the South (83.3%). Number of Instagram posts and followers were not significantly correlated with hospital reputation ($P = 0.12$, $P = 0.63$).

Conclusions: Social media is underutilized by plastic surgery fellowship programs. While Instagram metrics such as posts and followers are not correlated with hospital reputation, the skewed distributions of fellowship accounts, both geographically and across platforms, represent areas of potential growth. *(Plast Reconstr Surg Glob Open 2023; 11:e5132; doi: 10.1097/GOX.0000000000005132; Published online 20 July 2023.)*

INTRODUCTION

Social media can be a powerful tool. The broad reach of popular social media platforms such as Facebook, Instagram, and Twitter is well documented, with 69%, 40%, and 23% of US adults using these respective platforms in 2021.[1] The percentage of US adults using Instagram has more than tripled since 2012, reflecting the general increase in social media pervasiveness in recent years.[1]

Given the large proportion of the population that is connected via social media, it is unsurprising that social media has become intertwined with advertising and promotion opportunities.[2,3] Plastic surgeons have identified this utility and adopted social media early on.[4] This started before 2010 with primarily large city solo practices focused on cosmetic surgery adopting social media marketing techniques.[4] However, more recently, an increasing number of academic plastic surgery training programs have started incorporating social media.[5] Residency program Instagram accounts have been appearing at exponential rates since 2015.[5,6] Twitter and Facebook program accounts have also increased exponentially and linearly since 2010.[5]

Beyond the overarching increase in adoption, the importance of social media for integrated plastic surgery residency programs has been demonstrated previously in the literature.[5] Studies have identified a significant correlation between number of social media followers and

*From the *Duke University School of Medicine, Durham, N.C.; and †Department of Surgery, Division of Plastic and Maxillofacial Surgery, Duke University Medical Center, Durham, N.C.*

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program performance metrics such as Doximity ranking and hospital ranking.[5] Other investigations have demonstrated the impact social media accounts have on residency program recruitment, with 89% of responding applicants reporting that they followed program accounts.[7] Indeed, applicants may learn a great deal about programs via social media posts, with posts highlighting social events being reported as the most useful.[7]

Although these findings may generalize to fellowship programs, there has not been a comprehensive analysis of social media utilization of plastic surgery fellowship programs performed to date. Previous investigations have found a paucity of social media or program website utilization in particular plastic surgery subspecialties such as aesthetic surgery and microsurgery, with current trends in prospective fellow and program interaction mainly occurring via program websites or in-person interaction at national and regional conferences.[8,9] The primary aim of this study was to characterize major plastic surgery fellowship programs' social media usage in an integrated analysis. By highlighting current social media patterns, we hypothesized that this study would provide an updated database of fellowship social media presence, as well as provide recommendations for fellowship program leadership to generate engagement with applicants.

Takeaways

Question: What is the landscape of social media usage by plastic surgery subspecialty fellowship programs, and what opportunities exist in this space?

Findings: Social media usage by plastic surgery subspecialty fellowship programs is scarce, with significant potential for growth. Instagram is the platform with the most activity. Hand surgery currently has the strongest presence of the subspecialties. We described the current practices and metrics for fellowship accounts on social media, which can be used to inform future efforts.

Meaning: Plastic surgery subspecialty fellowship programs currently underutilize social media.

METHODS

A composite list of United States plastic surgery fellowship programs in five major subspecialties was available through the public database plasticsurgeryfellowship.org.[10] Four subspecialties (hand, microsurgery, craniomaxillofacial, and aesthetic) were included in the analysis, with global surgery and gender affirmation fellowships being excluded due to relative scarcity of programs. The hand fellowship program list was verified with the American Society for Surgery of the Hand (ASSH) Fellowship Directory when applicable,[11] and programs with separate plastic and orthopedic surgery programs were counted once. The microsurgery fellowship program list was verified with the American Society for Reconstructive Microsurgery fellowship search when applicable.[12] The craniomaxillofacial surgery list was verified with the American Society of Craniofacial Surgeons fellowship directory,[13] and the aesthetic surgery list was verified with the Aesthetic Society (ASAPS) endorsed fellowship programs.[14] Remaining programs on plasticsurgeryfellowship.org that were not listed in their respective national society databases (ASSH, American Society for Reconstructive Microsurgery, American Society of Craniofacial Surgeons, ASAPS) were queried online for program information before inclusion in the final program list.

The complete list of fellowship programs was independently queried on three separate platforms (Instagram, Facebook, and Twitter) to evaluate for social media presence. Queries included fellowship program names with their respective conjugates and abbreviations, combined with the terms "hand" for hand surgery, "micro" or "microsurgery" for microsurgery, "craniomaxillofacial" or "CMF" for craniomaxillofacial surgery, and "aesthetic" or "cosmetic" for aesthetic surgery. Additional parameters specific to each social media platform were collected. A detailed list of all parameters collected can be found in Table 1. Geographic locality (South, West, Midwest, Northeast) was extracted for each identified fellowship program. Fellowship performance metrics were extracted, defined as the combined total of US News report "high-performing" and "nationally ranked" specialties in the fellowship affiliated hospital. Data were collected between August and December 2022 and compiled in Microsoft Excel (Microsoft Corporation, Redmond, Wash.) for analysis.

Table 1. Social Media Parameters

Instagram general parameters:
Instagram handle, business account status, business label, account creation date, program geographic location, program director Instagram status, number of followers, number following, number of posts, and Instagram post type
Instagram post parameters (per previously described parameters: *Azoury, Annals of Plastic Surgery, 2020*):
Education: nonvisiting lecturers, graphics, or events related to education
Visiting lecture: any lecturer from a separate institution
Operative: any photographs taken in the operating room
Social: fellows or leadership outside the operating room or academic setting
Program info/promotional: flyers, digital graphics, or events that served to highlight program information
Other: all remaining miscellaneous posts
Facebook parameters:
Likes, followers, and creation date for Facebook pages, number of members and creation date for Facebook groups, and geographic location
Twitter parameters:
Account handle, join date, number of followers, number following, and program geographic location

Instagram user parameters (number of followers, number of posts) were assessed for correlation with hospital performance metrics. Given the data could not be assumed to be normally distributed, the statistical analysis of choice was pairwise Spearman rank-order correlation, a nonparametric measure of both the magnitude and direction of association between two variables. Statistical analysis was conducted in MATLAB (MathWorks Inc. Natick, Mass.).

RESULTS

There were a total of 25 Instagram accounts, four Facebook accounts, and three Twitter accounts across all investigated subspecialties. Of these subspecialties, hand surgery had the greatest social media presence on Instagram with 19.5% of programs having Instagram accounts (hand: 19.5%; aesthetic: 11.1%; craniomaxillofacial: 4.2%; versus microsurgery: 2.3%). Hand surgery also had the strongest presence on Twitter, with 3.4% of programs having accounts (hand: 3.4%, aesthetic: 0%, craniomaxillofacial: 0%, microsurgery: 0%). Microsurgery was the most prevalent subspecialty on Facebook with 4.7% of programs having a Facebook presence (microsurgery: 4.7%, aesthetic: 2.2%, hand: 1.1%, craniomaxillofacial: 0%).

Hand Surgery

Instagram

Of the 87 hand fellowship programs, 17 (19.5%) had Instagram accounts. In total, 29.4% of accounts were business accounts. Accounts were first created between 2018 and 2022, with the majority (11/17) appearing between 2020 and 2021. Median follower count for these accounts was 854, median following count was 146, and median post count was 34. The most common post type was social posts (median = 6), and the least common post types were visiting lecturer posts (median = 1) and "other" (median = 1). Of the 17 programs, four program directors had personal Instagram accounts. The hand section of Supplemental Digital Content 1 describes each Instagram account and the collected characteristics. (**See table, Supplemental Digital Content 1,** which displays fellowship Instagram accounts and associated characteristics, divided by subspecialty. **http://links.lww.com/PRSGO/C686**.)

Twitter and Facebook

Three of the 87 (3.4%) hand fellowship programs had Twitter accounts. The oldest account was created in October 2020 and had 81 followers and 15 following. The next oldest account was created in January 2021 and had 15 followers and 22 following. The youngest account was created in September 2021 and had five followers and eight following. One of the 87 hand fellowship programs had a Facebook presence (1.1%), a Facebook page created in October 2015, with 17 likes and 18 followers.

Microsurgery

Instagram

Only one of the 43 microsurgery programs had a fellowship Instagram account. The account was not a business account and was created in 2020. It had 1061 followers, 1422 following, and 54 posts. The most prevalent post types were operative posts (n = 34) and social posts (n = 8). The least prevalent was "other" (n = 1). The program director had a personal Instagram account. Details can be found in the Microsurgery section of Supplemental Digital Content 1 (**http://links.lww.com/PRSGO/C686**).

Twitter and Facebook

There were no microsurgery Twitter accounts. Two of 43 microsurgery programs (4.7%) had a Facebook presence. Both were private Facebook groups with 53 members and nine members, respectively.

Craniomaxillofacial

Instagram

Of the 47 craniomaxillofacial fellowship programs, two (4.2%) had Instagram accounts. One of the two (50%) was a business account. Both accounts were created in 2019. Median number of followers was 1296.5, with a median number of 258 following. Median post count was 89. The top post types were program info/promotional (median = 37.5) and operative (median = 27), with the least common post type being visiting lecturers (median = 1). One of two program directors had a personal Instagram account. The craniomaxillofacial section of Supplemental Digital Content 1 (**http://links.lww.com/PRSGO/C686**) describes the Instagram accounts and collected characteristics.

Twitter and Facebook

There were no craniomaxillofacial Twitter accounts or Facebook accounts.

Aesthetic

Instagram

Five of 45 (11.1%) aesthetic fellowship programs had Instagram accounts. Zero percent of accounts were business accounts. One account was created each year between 2017 and 2021. Accounts had a median follower count of 1157, following count of 244, and post count of 61. The most common post types were operative posts (median = 25) and program info/promotional posts (median = 15), and the least common post type was visiting lecturer posts (median = 0). Four of the five (80%) program directors had personal Instagram accounts. The aesthetic section of Supplemental Digital Content 1 describes each Instagram account and the collected characteristics (http://links.lww.com/PRSGO/C686).

Twitter and Facebook

None of the aesthetic fellowship programs had Twitter accounts. One of the 45 (2.2%) aesthetic fellowship programs had a Facebook presence, which was a Facebook page created in July 2016. The page had 1327 likes and 1383 followers.

Aggregate Results:

An overview of the social media presence of each fellowship specialty can be seen in Table 2. Aggregating hand, microsurgery, craniomaxillofacial, and aesthetic data, the first fellowship social media accounts were created

Table 2. Aggregate Data for Plastic Surgery Fellowship Program Accounts on Instagram, Twitter, and Facebook

Fellowship	Social Media Parameter				
Hand					
Social media platform					
Instagram	**Percentage of Fellowship Programs with Accounts**	**Percentage of "Business" Accounts**	**Median No. Followers**	**Median No. Following**	**Median No. Posts**
	19.5%	29.4%	854	146	34
Twitter	**Percentage of Fellowship Programs with Accounts**		**Median No. Followers**	**Median No. Following**	
	3.4%		15	15	
Facebook	**Percentage of Fellowship Programs with Accounts**			**Predominant Facebook Account Type**	
	1.1%			Facebook Page	
Microsurgery					
Social media platform					
Instagram	**Percentage of Fellowship Programs with Accounts**	**Percentage of "Business" Accounts**	**Median No. Followers**	**Median No. Following**	**Median No. Posts**
	2.3%	0%	1061	1422	54
Twitter	**Percentage of Fellowship Programs with Accounts**		**Median No. Followers**	**Median No. Following**	
	0%		N/A	N/A	
Facebook	**Percentage of Fellowship Programs with Accounts**			**Predominant Facebook Account Type**	
	4.7%			Facebook Group	
Craniomaxillofacial					
Social media platform					
Instagram	**Percentage of Fellowship Programs with Accounts**	**Percentage of "Business" Accounts**	**Median No. Followers**	**Median No. Following**	**Median No. Posts**
	4.2%	50%	1297	258	89
Twitter	**Percentage of Fellowship Programs with Accounts**		**Median No. Followers**	**Median No. Following**	
	0%		N/A	N/A	
Facebook	**Percentage of Fellowship Programs with Accounts**			**Predominant Facebook Account Type**	
	0%			N/A	
Aesthetic					
Social media platform					
Instagram	**Percentage of Fellowship Programs with Accounts**	**Percentage of "Business" Accounts**	**Median No. Followers**	**Median No. Following**	**Median No. Posts**
	11.1%	0%	1157	244	61
Twitter	**Percentage of Fellowship Programs with Accounts**		**Median No. Followers**	**Median No. Following**	
	0%		N/A	N/A	
Facebook	**Percentage of Fellowship Programs with Accounts**			**Predominant Facebook Account Type**	
	2.2%			Facebook Page	

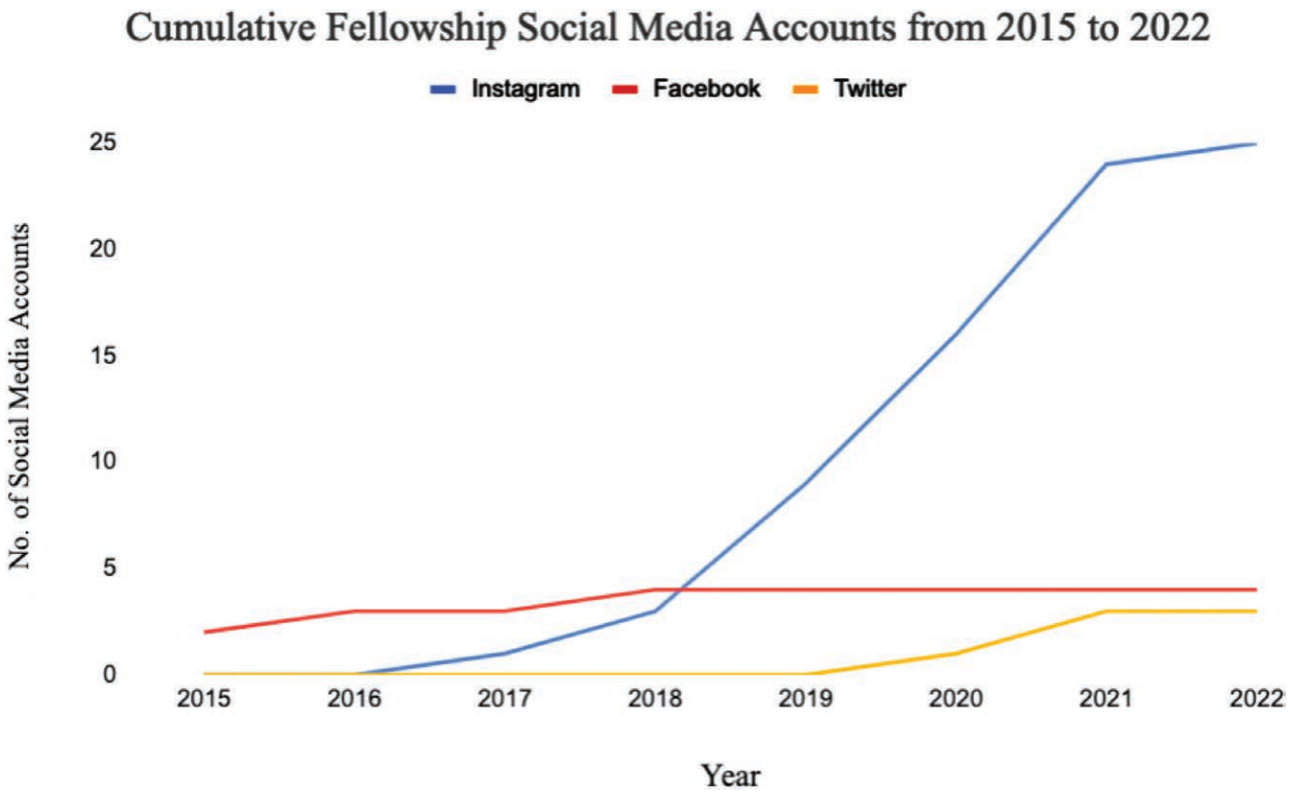

Fig. 1. Cumulative number of plastic surgery fellowship accounts, separated by social media platform. Number of accounts were aggregated across all studied subspecialties (hand, microsurgery, CMF, aesthetic).

in 2015 on Facebook (Fig. 1). The number of Facebook accounts doubled between 2015 and 2022. The number of Instagram accounts increased by the largest magnitude after the creation of the first account in 2017. Twitter was the last platform to be adopted, with the first account created in 2020.

Geographically, social media accounts (Facebook, Twitter, and Instagram collectively) represented hand programs located in the Southern United States (28.6%), West Coast (28.6%), Midwest (28.6%), and Northeast (14.3%; Fig. 2A). An estimated 66.7% of microsurgery social media accounts were from Midwest programs, and 33.3% were from Southern program(s) (Fig. 2B). In total, 100% of craniomaxillofacial social media accounts were from Midwest programs (Fig. 2C). An estimated 83.3% of aesthetic social media accounts were from Southern programs, and 16.7% were from Northeastern program(s) (Fig. 2D).

Number of Instagram followers was not significantly correlated with program hospital reputation as measured by number of "nationally ranked" and "high-performing" specialties on US News rankings (P = 0.12, rho = 0.35). Number of Instagram posts was not significantly correlated with hospital reputation (P = 0.63, rho = 0.11).

DISCUSSION

To our knowledge, this study provides the most comprehensive view of plastic surgery subspecialty fellowship social media usage in the United States to date. Despite our finding that social media metrics do not correlate with fellowship program hospital ranking, it has been previously established that social media promotion can provide training programs with vast benefits in various aspects, including recruitment, education, and community development.[5–7] Historically, plastic surgery, among all surgical specialties, has led the social media initiative, even in academic settings, with over half of training programs maintaining some form of social media presence.[5] This enthusiastic adoption of social media has positively impacted both applicants appraising various programs and program directors hoping to improve metrics such as yield and total applicants. In investigations by Irwin et al, a majority of plastic surgery applicants reported that residency program social media content positively impacted their perception of the program, and more importantly, its rank list location.[15] Additionally, the timing of the paradigm shift toward social media usage must be noted. The earliest incident of a plastic surgery residency Instagram account was in 2015, and Steele et al recently reported that the majority of plastic surgery applicants accessing training program profiles are in the millennial generation.[16] As this cohort of plastic surgery residents approaches fellowship match, the potential benefit of a social media presence for fellowship programs cannot be discounted. On the basis of the gaps and practices we identified in our cross-sectional study, the study team has generated a summary table of actionable recommendations for subspecialty fellowship programs considering social media adoption (Table 3).

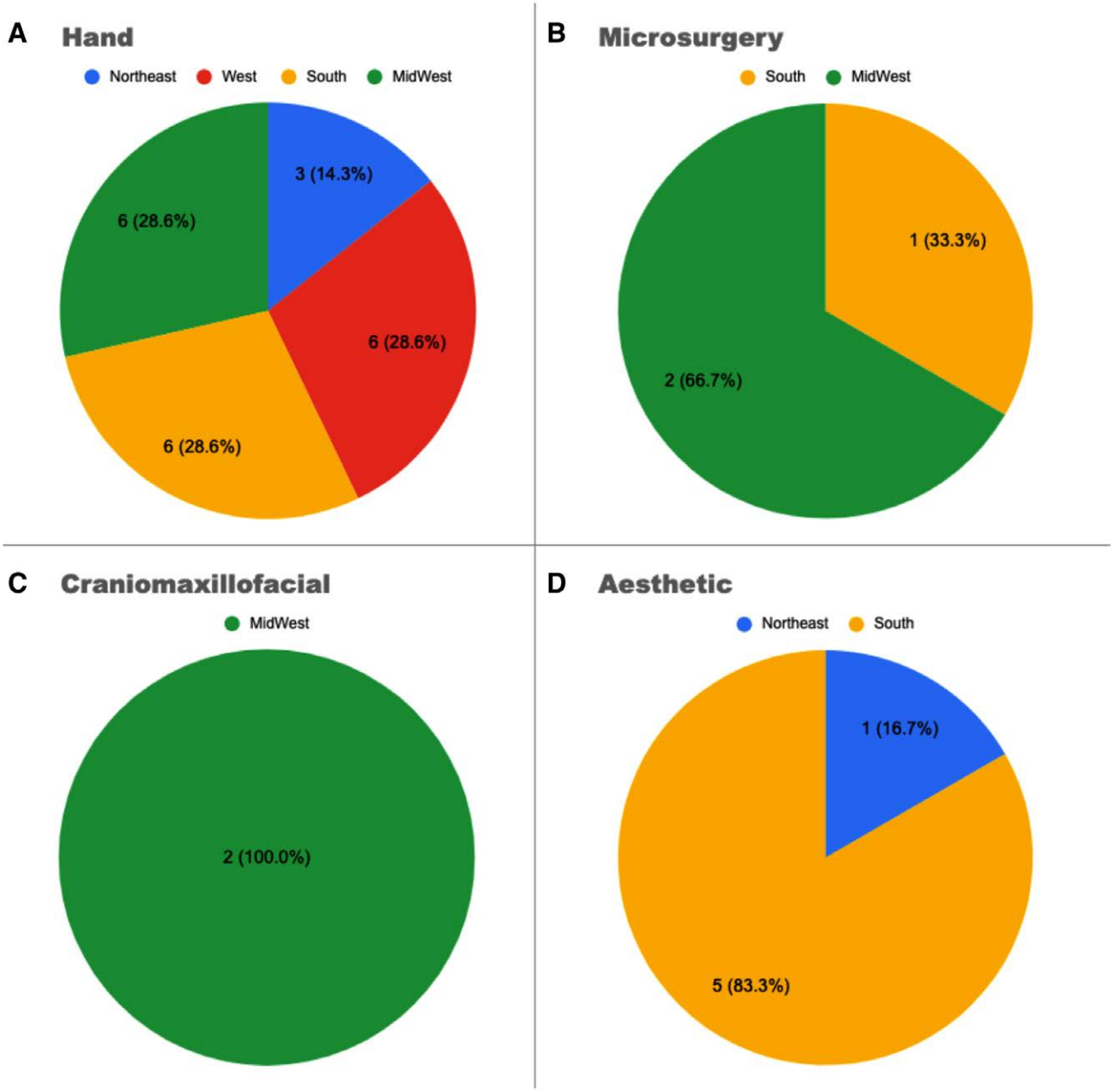

Fig. 2. Geographic distribution of plastic surgery fellowship programs with social media accounts (hand, microsurgery, CMF, aesthetic).

We found that there is an overall paucity in fellowship programs utilizing social media, with only 14.4% (32/222) of programs across hand, microsurgery, craniomaxillofacial, and aesthetic surgery having either an Instagram, Twitter, or Facebook account. This phenomenon is not unique to plastic surgery. It has been previously demonstrated that only 10% of pulmonary and critical care fellowship programs in the United States have Twitter accounts.[17] Other studies have shown that although social media presence is positively associated with nephrology program fill rates, the majority of programs (61%) had no form of social media.[18] The relatively shorter length of fellowship programs when compared with residency programs is a possible explanation for these findings. Shorter program lengths could be a barrier to both the creation of a community[19] and the identification of social media managers,[20] particularly if accounts are managed by fellows. We therefore recommend individuals with more longitudinal involvement, such as fellowship program directors, to oversee the primary direction of these accounts.

The majority of fellowship social media accounts were from hand surgery programs (65.6%, 21/32), which dominated both Instagram and Twitter. Part of this observation may be attributed to the overlap between orthopedic surgery and plastic surgery for hand programs,[21] with orthopedic surgery being a relatively larger field that has also demonstrated increasing social media usage over recent years.[22] Regardless of the reason, hand social media

Table 3. Recommendations for Plastic Surgery Fellowship Program Leadership Regarding Social Media Usage

Consideration	Recommendations
Social media presence	Overall, plastic surgery subspecialty fellowship programs should have a greater social media presence
	Microsurgery and craniomaxillofacial fellowship programs may benefit from early adoption of social media hand, and aesthetic programs have a more robust presence at this stage
Social media leadership	Social media accounts should be managed by individuals with longitudinal involvement in the program
Social media platform	Programs primarily seeking engagement should prioritize the development of social media accounts on Instagram, with consideration of platform-specific strengths and drawbacks
	Programs with established Instagram accounts may benefit from being early adopters of the Facebook and Twitter platforms
Social media content	Care should be taken to adhere to patient privacy guidelines to do so while providing compelling and consistent content, we suggest the adoption of previously described frameworks for social media post archetypes, as in Azoury et al[5]
Social media geography	Fellowship programs in underrepresented geographic locations should prioritize developing social media accounts to better represent their region

accounts can serve as models for future microsurgery and craniomaxillofacial accounts, as the latter have a disproportionately low presence on social media in relation to their sizes.

Instagram is the platform most utilized by fellowship programs, with 78.1% (25/32) of total social media accounts being Instagram accounts. Engagement metrics such as median follower counts were also substantially higher across all specialties on Instagram, when compared with Twitter or Facebook. Twitter accounts had follower counts of less than 100 and only represented 9% (3/32) of total social media accounts, with Facebook reflecting similarly low numbers. Instagram's majority share aligns with previous findings for integrated residency social media use, although it is more dramatic in this setting.[5] This is somewhat surprising given the relatively higher market share of Facebook and Twitter compared with Instagram,[23] although the most popular social media platforms for health professionals may not reflect the preferences of the general public. Importantly, differing social media platforms have differing inherent strengths and weaknesses. For instance, Instagram is a primarily visual platform, whereas Twitter is a platform primarily centered around text-based discussion. Visual platforms such as Instagram may raise concerns for patient privacy violations when uploading photographs. Meanwhile, text-based discussions including the popular "Tweetorial" format on Twitter may facilitate educational efforts. These are important considerations for program leadership when choosing which platform(s) to occupy.

Of note, community size has been studied extensively in both in-person and online social networks; it has been found to be intertwined with the establishment and success of social media networks.[24] In this sense, Instagram may be the platform most well positioned for future growth and interaction in the fellowship space. Regardless of predominant Instagram post type, accounts should include a comprehensive mixture of educational posts, operative posts, social posts, info/promotional posts, and visiting lecture posts, as we found is the current practice providing a holistic view of fellowship programs. Additionally, although Instagram business accounts may provide additional metrics such as audience reached, they represented no more than half of all accounts for any given subspecialty. At this stage, this practice and the presence of a fellowship director social media account are variable and likely best considered on a case-by-case basis.

There has been a relatively substantial increase in fellowship social media accounts over time since 2015, particularly on Instagram. This is not dissimilar to integrated residency social media trends over time, which have demonstrated exponential growth in Instagram and Twitter over the last decade, and linear growth in Facebook over the last decade.[5,6] Should these rates be maintained, there may be a time in the near future when the vast majority of fellowship programs have social media accounts.

Geographically, only social media accounts for hand programs spanned the entirety of the United States. These were equally concentrated in the Southern United States, West Coast, and Midwest (28.6%) and least concentrated in the Northeast (14.3%). Microsurgery and craniomaxillofacial social media accounts overrepresented the Midwest, whereas aesthetic social media accounts overrepresented programs in the Southern United States. These discrepancies in geographic representation may represent challenges to fellowship applicants interested in matching at specific locations in the United States. It has been shown that medical trainees often have significant geographic preferences.[25–27] Previous large dataset analyses have also demonstrated that plastic surgery patient concerns vary geographically,[28,29] which may reflect different training emphases depending on institutional location. Because of the importance of geography in the training process, ideally fellowship social media accounts would represent programs in a broader range of locations.

Limitations

This is a cross-sectional analysis. As such, we are unable to generate causal inferences with our correlative findings. Therefore, we are unable to answer important questions such as the potential impact of social media usage on fellowship yield, number of applications, and quality of applicants. Furthermore, this study does not cover any plastic surgery subspecialties beyond aesthetic surgery, craniomaxillofacial surgery, microsurgery, and hand surgery, given the scarcity of social media data outside of these subspecialties. Similarly scarce were the data

for select platforms such as Facebook, which limits generalizability of findings within these platforms. As a part of our analysis, we utilized national hospital reputation rankings as a proxy for fellowship programs' prestige and overall performance. This is an imperfect proxy, especially given the recent trends moving away from ranking systems as valid metrics,[30] which may reduce the validity of these findings. However, US News rankings represent one of few means to discern between fellowship programs at the current time, particularly given the absence of a Doximity fellowship list akin to Doximity residency rankings. We also limited our social media analysis to the three most reported platforms in this space (Twitter, Instagram, and Facebook) to maintain reporting consistency. We therefore did not capture data from other popular platforms such as YouTube and Tik Tok, which may be targets for future studies. As Tik Tok is one of the newest, fastest growing social media platforms, these excluded data may contain the newest trends in social media usage by plastic surgery fellowships, which introduces significant selection bias.

CONCLUSIONS

Social media usage by plastic surgery subspecialty fellowship programs is scarce. This is a space with significant potential for growth. Instagram is the platform with the most activity and promise, with median followers for fellowship programs in the hundreds or thousands. However, the paucity of current fellowship presence on both Twitter and Facebook represents opportunities for early adopters to dominate these platforms. Hand surgery currently has the strongest presence of the subspecialties on Instagram and Twitter, whereas microsurgery has the strongest presence on Facebook. The scarcity of microsurgery fellowship Instagram accounts despite the large number of microsurgery fellowship programs in the United States is a notable discrepancy. Such discrepancies can be addressed by fellowship programs seeking to increase visibility and engagement. We described the current practices and metrics for fellowship accounts on social media, which can be used to inform future efforts.

Brett T. Phillips, MD, MBA
Division of Plastic, Oral, and Maxillofacial Surgery
Duke University Medical Center
10 Duke Medicine Circle
Durham, NC 27710
E-mail: brett.phillips@duke.edu
Instagram: @dukeplasticsurgery

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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