

The Relationship between Plastic Surgery Residency Instagram Characteristics and Doximity Rank

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Background: Social media provides unique insight into the facilities, personnel, and culture of plastic surgery residency programs. Applicants can gain a more holistic view of programs based on their social media accounts. This study aims to evaluate the relationship between the popularity of a program's Instagram account and the program's Doximity ranking and to investigate the factors which contribute to greater viewership, with a special focus on diversity.

Methods: Using Doximity's 2021-2022 Residency Navigator, a list of all integrated plastic surgery residency programs was obtained, and their social media accounts were documented. Instagram accounts were analyzed for metrics, post content, and website links. A 15-month period of posts was analyzed, then grouped into eight categories. Diversity was assessed using average Fitzpatrick skin type for each post containing photographs of people.

Results: Of the 88 programs, 85 (96.6%) had an Instagram account at the time of analysis. Analysis of Instagram post content found that personnel and social function posts had significantly more likes than other categories. Posts with average Fitzpatrick type greater than or equal to III also had significantly more likes. Linear regression demonstrated a positive relationship between higher Doximity rank and number of followers; however, there was no clear relationship between rank and posts per week or engagement score.

Conclusions: Plastic surgery social media accounts may make a positive impact on followers. It is important to understand the factors that can increase engagement and broaden viewership. Tailoring posts based on content popularity and highlighting diversity may help to accomplish these goals. (*Plast Reconstr Surg Glob Open* 2023; 11:e5078; doi: [10.1097/GOX.0000000000005078](https://doi.org/10.1097/GOX.0000000000005078); Published online 21 June 2023.)

INTRODUCTION

As of October 2022, there were 4.74 billion social media users around the world, with an average rate of six new users joining every second.¹ Plastic surgery residency programs have incorporated social media as part of their recruitment process, taking advantage of its increasing use by applicants. Social media provides an easily accessible avenue to highlight the facilities, resources, and culture of a residency training program, which are key determinants of resident recruitment. Residency programs are using various social media platforms, including

Instagram, Facebook, and Twitter. However, Instagram continues to be the most widely used social media platform by plastic surgery residency programs.² A study showed that 70% of surveyed integrated plastic surgery residency applicants used Instagram during the 2020–2021 application cycle.³

Applicants can gain a more holistic view of programs based on their social media accounts, with information that is not found on program websites or other online resources. Instagram accounts have the ability to candidly show residents' day-to-day routine at work, resident life outside the hospital, work-life balance, educational highlights, and other aspects of program culture and wellness that would not traditionally be available to applicants.⁴ All of these insights provided by social media may influence program rank lists.⁵ Social media accounts can also display more widely available information in a novel manner through faculty highlights, alumni features, and publication spotlights. Furthermore, the majority of the influence social media has on an applicant's rank list is positive.^{6,7} According to a survey study conducted by

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Irwin et al,⁸ of all plastic surgery residency applicants who were influenced by social media, 72% of them indicated a positive influence. However, specific factors contributing to a more popular plastic surgery residency social media presence are not widely known.

The Doximity Residency Navigator is the only ranking tool available to plastic surgery residency applicants.⁹ The website allows applicants to sort residencies based on reputation and research and provides satisfaction rankings for each individual program. Doximity's reputation ranks are derived from combined nominations for "programs that offer the best clinical training" submitted by board-certified physicians over the last 3 years, weighted to account for alumni or program director status, program size, and time since graduation.¹⁰ A recent survey of program directors and department chairs suggested that these rankings may be poor estimates of a program's desirability or quality.¹¹ Despite this evidence, Doximity reputation rankings continue to be widely used by and influence applicants of various residency programs, including plastic surgery.^{12,13} This study aimed to evaluate the correlation between the popularity of a plastic surgery residency's Instagram account, defined as the Instagram engagement score or the number of followers, and the program's Doximity reputation ranking. We also aim to examine the correlation between account popularity and both post frequency and post content. Furthermore, we investigate whether account popularity is correlated to greater diversity in posts, as defined by higher Fitzpatrick skin type.

METHODS

Using Doximity's 2021–2022 Residency Navigator reputation filter, a list of all ranked integrated plastic surgery residency programs was obtained. Location was determined using Doximity's regional assignment of each program, which includes the regions Northeast, South, Midwest, and West. To find the presence of a program's Instagram, Facebook, or Twitter account, we used a combination of search strategies. These included a search of the program webpage on the Doximity listing then a Google search with the keywords "program name" plastic surgery residency Instagram OR Facebook OR Twitter. If this failed to yield results, we used the search function in the respective social media platforms using the keywords "program name" plastic surgery residency.

Instagram accounts were analyzed for the number of followers, the number of posts, presence of program website link in the Instagram page, presence of Instagram account link on the program website, and whether highlights, Reels, or Instagram TV were utilized. An engagement score for each Instagram account was calculated as the number of comments and likes per post divided by the number of followers multiplied by 100%.¹⁴ Individual Instagram posts from January 1, 2021 to March 31, 2022 were counted and analyzed for post format, the number of likes, content of posts, and average Fitzpatrick skin type in posts featuring people. These dates were selected to account for the reviews included in the Doximity 2021–2022 Nomination Survey, which opened in April 2022.

Takeaways

Question: Do plastic surgery residency programs with higher Doximity reputation rankings or certain social media characteristics have more popular Instagram accounts?

Findings: Based on 88 integrated plastic surgery programs, higher Doximity rank showed a positive relationship with the number of followers, but not with post frequency or engagement score. Posts with average Fitzpatrick skin type greater than or equal to III had more likes than those that did not. Posts containing personnel highlights had more likes than other categories.

Meaning: A plastic surgery residency program can attract followers and, potentially, applicants through social media by highlighting diversity and people.

Posts were grouped in eight distinct categories: (1) displays of cases—specific clinical cases or vignettes; (2) facilities—equipment, buildings, tours, or technology; (3) training environment—training courses, program structure, team interactions in the workplace, or program recruitment; (4) resident social functions—life outside of the workplace or participating in a social activities; (5) personnel highlights—short bios or work of individual residents, faculty, visiting guest speakers, or other staff; (6) research—conferences, publications, or journal clubs; (7) advocacy—awareness of social issues, diversity, equity, and inclusion; and (8) other—posts outside one of these selected topics. For each photograph containing people, a Fitzpatrick skin type I–VI was assigned to each person; then, the average Fitzpatrick skin type was calculated for each post.¹⁵ Two authors independently conducted the account searches. All disagreements between authors were resolved by discussion with a third author.

Descriptive statistics were obtained from the collected data. Data analysis, including linear regression and comparison of means (independent samples *t*-test and one-way analysis of variance), and Kruskal-Wallis H test for non-normal distributions were further performed on the data set using IBM Statistical Package for the Social Sciences software (SPSS; version 28) (IBM, Armonk, N.Y.). This study was exempt from institutional review board approval because no human subjects were involved in the study.

RESULTS

Overall, 88 integrated plastic surgery residency programs were evaluated for the presence of an Instagram, Facebook, or Twitter account. Eighty-five (96.6%) programs had an Instagram account, 23 (26.1%) had a Facebook account, and 28 (31.8%) had a Twitter account (Table 1). Of the 85 integrated plastic surgery residency programs identified to have Instagram accounts, 26 programs (30.6%) had a link to their Instagram page on their program website, and 52 programs (61.2%) had the program website linked in the Instagram account biography. When examining Instagram features, 69 programs

Table 1. Plastic Surgery Residency Program Social Media Participation

Program Characteristics	Number of Programs (%)
Programs with Twitter	28 (31.8%)
Programs with Facebook	23 (26.1%)
Programs with Instagram	85 (96.6%)
Programs that used Reels	64 (75.3%)
Programs that used Highlights	69 (81.2%)
Programs with website linked on Instagram account	52 (61.2%)
Programs with Instagram linked on website	26 (30.6%)

(81.2%) used highlights and 64 programs (75.3%) used Reels (Table 1). Analysis of Instagram post content showed that 38.3% of posts depicted personnel; 25.5%, aspects of the training environment; 13.9%, resident social functions; 10.5%, research; 4.0%, displays of cases; 3.6%, advocacy; 1.7%, aspects of the facilities; and 2.2%, other topics (Table 2).

When comparing Doximity rank with Instagram account popularity, linear regression did show a positive relationship between higher Doximity rank and the number of followers ($R = 0.61$, $R^2 = 0.37$) (Fig. 1). Each additional Instagram follower was associated with a 0.01 increase in Doximity rank ($P < 0.001$). Linear regression did not reveal a close relationship between Doximity rank and the number of posts per week ($R = 0.06$; $R^2 = 0.00$). Furthermore, no clear relationship was found between Doximity rank and Instagram engagement score ($R = 0.08$; $R^2 = 0.01$).

Linear regression showed a weak positive relationship between engagement and the total number of posts in the

Table 2. Plastic Surgery Residency Program Social Media Account Characteristics

Characteristic	Average (%)	Minimum	Maximum
Number of followers	1984.5	471	7003
Number following	384.01	30	1809
Number of total posts	156.1	25	767
Number of analyzed posts	42.1	2	180
Number of likes	84.1	1	1292
Number of views on Reels	483.7	0	4127
Engagement score	3.9	1.5	15.7
Date of sfirst post	1/31/19	10/4/15	4/13/22
Posts per week	0.6	0	2.8
Number of analyzed posts that are photographs	40.07 (95.1)	1	171
Number of analyzed posts that are Reels	2.3 (5.4)	0	49
Number of analyzed posts with mean Fitzpatrick score ≥ 3	6.7 (16.0)	0	52

account ($R = 0.40$; $R^2 = 0.15$) as well as the total number of posts per week ($R = 0.32$; $R^2 = 0.10$). Linear regression also showed a very weak positive relationship between the proportion of analyzed posts that were videos and both the number of followers and the engagement score ($R = 0.12$; $R^2 = 0.01$ and $R = 0.38$; $R^2 = 0.14$, respectively) (Fig. 2). Posts with people depicted had an average of 89.4 ± 61.1 likes, whereas those that did not had 52.4 ± 40.6 likes which a Kruskal-Wallis H test showed to be statistically significant ($P < 0.001$). A Kruskal-Wallis H test showed that there was a statistically significant difference in the

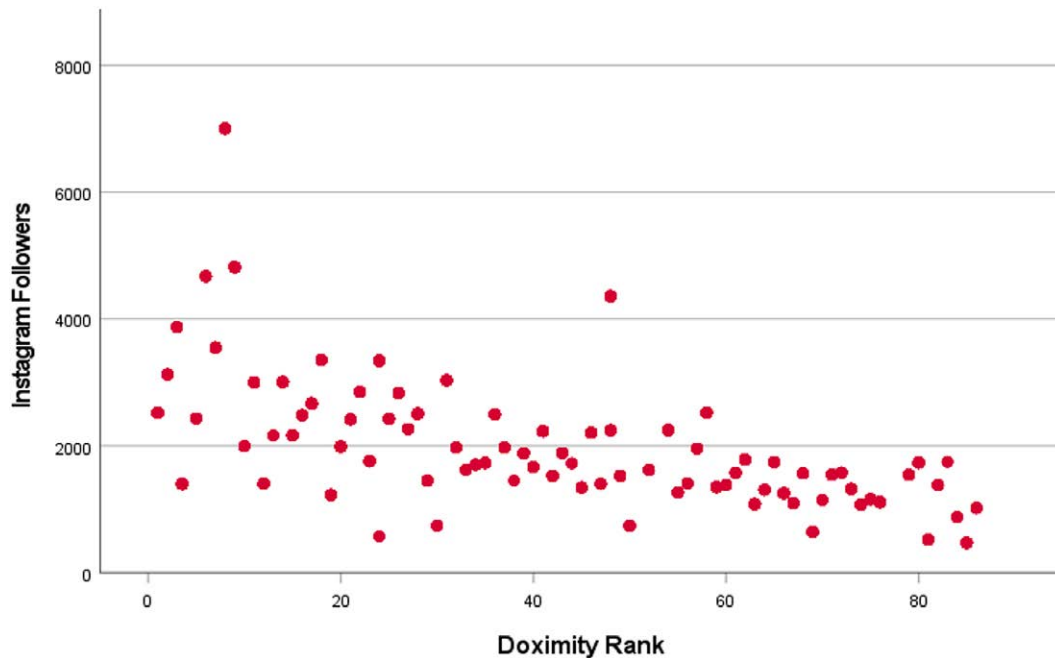


Fig. 1. Scatter plot of Doximity rank versus the number of Instagram followers per residency account. A ranking of one was the highest ranking program by reputation, whereas a ranking of 85 was the lowest ranking program by reputation.

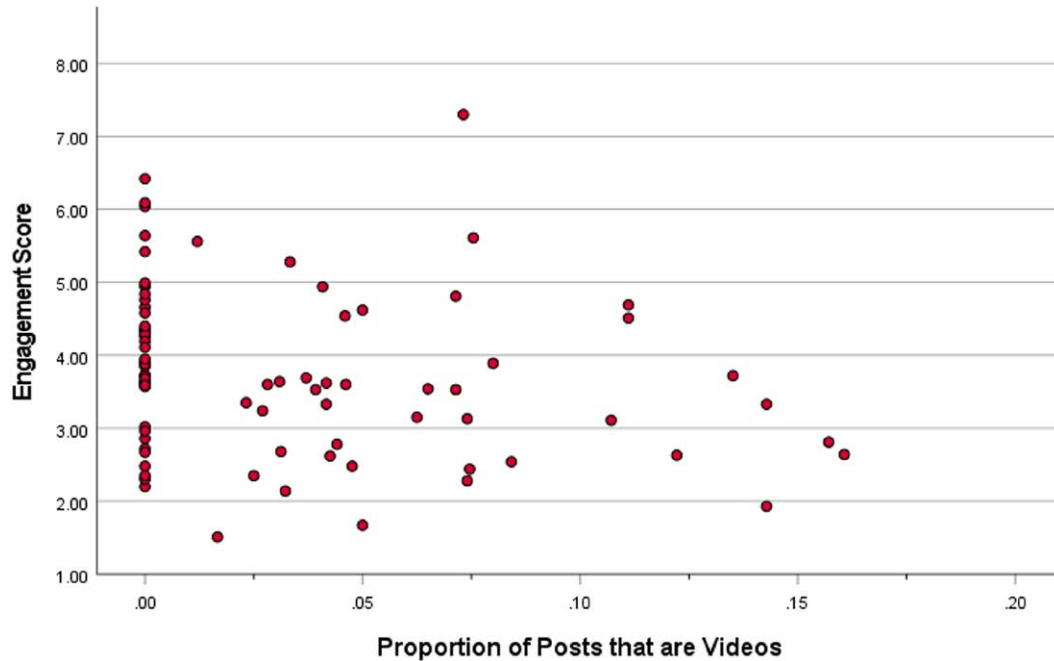


Fig. 2. Scatter plot demonstrating the proportion of Instagram posts that are videos versus the engagement score for each residency program account.

number of likes between the different post categories ($P < 0.001$). Notably, the “personnel” category had a significantly higher number of likes (average 98.2 ± 74.8) than every other category except “resident social functions.” Similarly, “resident social functions” had a significantly higher number of likes (average 85.6 ± 44.4) than every other category except “personnel” (Fig. 3). There was no statistically significant difference in followers between any of the geographical regions as determined by one-way ANOVA ($P = 0.06$).

When examining diversity within Instagram accounts, there was a statistically significant difference between geographical regions in the proportion of posts with an average Fitzpatrick skin type greater than or equal to III as determined by one-way ANOVA ($P < 0.05$). A Tukey post hoc test revealed that the proportion of posts with skin type greater than or equal to III in programs of the Midwest region was significantly lower than that of the West region ($P < 0.05$). There were no other statistically significant differences between regions. There was also no significant difference in the proportion of posts with average skin type greater than or equal to III between high (ranks 1–28), middle (ranks 29–57), and low (58–85) Doximity ranked programs as determined by one-way ANOVA ($P = 0.63$). Instagram posts depicting people with average mean skin type greater than or equal to III had an average of 92.3 ± 62.6 likes, whereas those that did not had 83.7 ± 48.8 likes, and a Kruskal-Wallis H test showed that this difference was statistically significant ($P < 0.05$). Linear regression did not demonstrate a clear relationship between mean Fitzpatrick skin type in posts and number of likes or engagement score ($R = 0.09$; $R^2 = 0.01$ and $R = 0.018$; $R^2 = 0.00$, respectively).

DISCUSSION

Social media utilization by patients, trainees, and surgeons is now ubiquitous in the specialty of plastic surgery. This can be seen with education, advertising, practice promotion, and resident recruitment. Our recent search revealed that 97% of plastic surgery residency programs now manage an Instagram account. This is in comparison to 57% of programs just 3 years ago.¹⁶ Residency Instagram accounts showcase a variety of content, including cases, facilities, personal highlights, research, and advocacy. This content is meant to reach many different audiences, but one key group is prospective applicants. In a survey-based study published by Irwin et al during the 2018 and 2019 academic years, 62% of plastic surgery residency applicants reported following a residency program on Instagram or Facebook.⁸ This number is likely much higher today. The importance of social media to prospective plastic surgery applicants is well known. In this study, we investigated the relationship between residency social media accounts and Doximity rankings then examined the posting history and diversity within posts to better understand what factors engage users.

Both engagement score and the number of followers can be viewed as correlates to the popularity of a social media account. There was a positive correlation between the number of Instagram followers and Doximity rank. However, there was no clear correlation between engagement score or the number of posts per week and Doximity rank. There are multiple possible explanations for this association. Programs with a more prominent reputation may be more frequently searched, making these accounts more visible to social media users. Alternatively, programs with higher rankings may also have more resources to

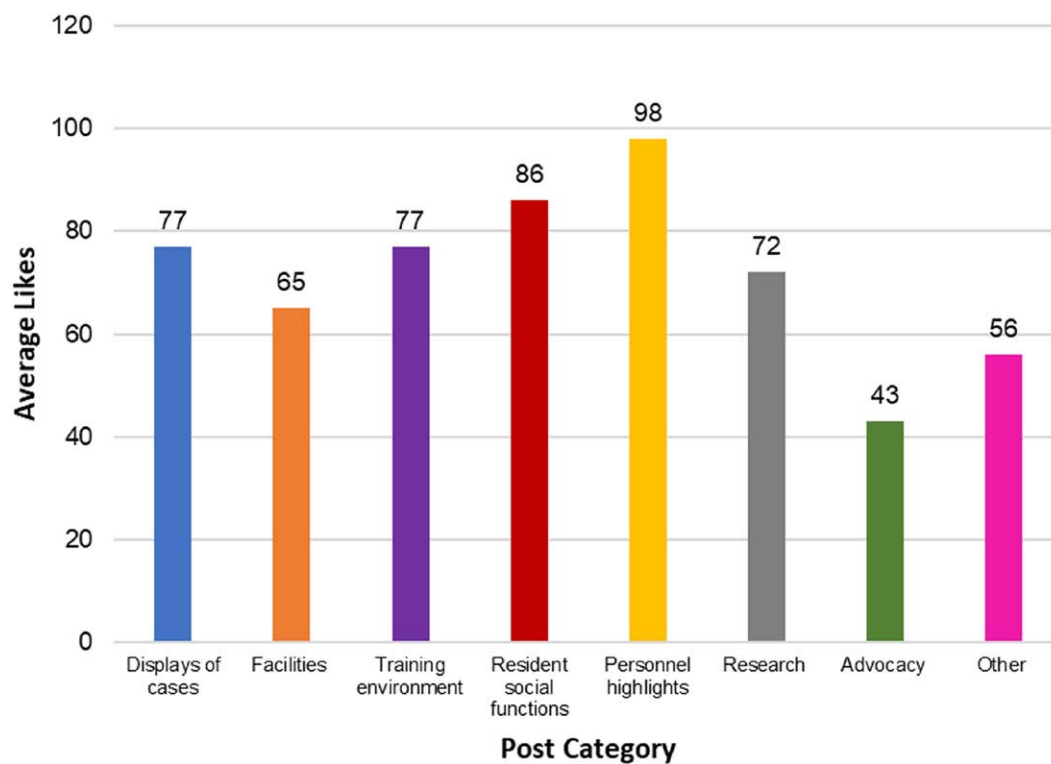


Fig. 3. The average likes per post for each of the eight post categories pooled for all plastic surgery residency Instagram accounts.

support social media platforms with consistent and high-quality content. In a study across 16 specialties, program size was also found to be a predictor of Doximity rank.⁷ In a study on social media for recruitment of orthopedic surgery residency programs, the presence of a social media account was found to correlate with higher Doximity ranking.¹⁷ However, this study did not correlate account engagement with Doximity ranking.

Residency social media accounts should be continuously attempting to expand their reach and increase their viewership. One way to gauge the success of this goal is by tracking numbers of views, likes, and followers. Instagram posts that depicted people received significantly more likes than posts without people. After categorizing posts, those featuring personnel and resident social functions had a significantly higher number of likes than every other type of post. These results were similar to the findings of a survey-based study by Pfibsen et al³, which reported that posts on social events/camaraderie and faculty or resident biographical posts were most helpful for applicants to learn about the program. In an analysis of the four most followed residency program Instagram accounts, Irwin et al¹⁸ found that posts displaying operative cases, accolades, and resident life resulted in the most significant increase in engagement statistics. Our study also identified a weak positive relationship between Instagram engagement score and both the total number of posts and the average number of posts per week. Finally, there was a weak positive relationship between the number of posts that were videos and the engagement score. This analysis provides

valuable insight for residency programs and account managers on the type of posts and the content of posts that lead to increased viewership. By tailoring content to more popular categories and adding more mixed media posts, programs can potentially increase their popularity and social media reach. In addition, consistently uploading stories, Reels, and posts will keep viewers engaged and help attract new followers.

This study also analyzed diversity in all Instagram posts including people, using average Fitzpatrick skin type. There was no statistically significant difference between program rank and proportion of posts with skin type greater than or equal to III. However, posts with an average skin type greater than or equal to III did receive significantly more likes. These data could indicate that social media users viewing plastic surgery residency accounts value diversity. Hispanic and African American residents remain underrepresented in plastic surgery.^{19,20} Increasing the diversity of the plastic surgery workforce is an important strategy to combat the well-documented racial and ethnic disparities present in the health care system. Although these data do not provide information on social media's influence on applicant program rank, it is important to discuss diversity in social media. Future studies could provide greater information on diversity, social media, and program rank.

There are several limitations to this study. Although engagement score and the number of followers can be used to quantify popularity of a social media account, these metrics do not represent total viewership. Some applicants

intentionally do not like or follow residency accounts to avoid drawing attention to their own social media accounts.²¹ An in-depth analysis on each post was only conducted for Instagram and not for Facebook or Twitter. We used this study design because Instagram is the most common form of social media used by residency programs. Post analysis was limited to our study period and does not necessarily reflect the entire post history of an account. Finally, Fitzpatrick skin type is a subjective metric, and higher Fitzpatrick skin type does not necessarily represent diversity. Other indicators of diversity, such as ethnicity, race, and gender, were considered but could not be reasonably inferred from social media posts. This may be better evaluated in future studies via a survey-based approach. Despite these limitations, we believe that this study is an accurate representation of programs' social media presence and content.

CONCLUSIONS

Plastic surgery social media accounts can make a positive impact on their followers. This impact can be amplified by increasing engagement and broadening viewership. In this study, we found that higher ranked programs tended to have more followers. We also showed that posts with people, social functions, and diversity were more often liked. Tailoring posts based on content popularity and highlighting diversity may help programs to expand their social media accounts and attract applicants by sharing these strengths.

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DISCLOSURE

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

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