ORIGINAL RESEARCH

Promoting neurosurgery interest among medical students in Africa: An analysis of the social media handles of the Association of Future African Neurosurgeons

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Abstract

Background

Social media is a powerful tool in the armamentarium of the modern-day physician, advancing education, research, and advocacy in neurosurgery. The African continent bears a considerable neurosurgical disease burden yet lacks the requisite human resources. Comprehensive analyses of social media strategies and their impacts on neurosurgical practices and interest groups in Africa are scarce. The Association of Future African Neurosurgeons (AFAN), an African neurosurgery interest group, assessed how its social media platforms have influenced neurosurgery interest among aspiring African neurosurgeons.

Methods

This social media analysis involved collecting and examining data on the types of publications, impressions, and reach from the Facebook, Twitter, and YouTube channels of AFAN from 31 December 2019 through 11 September 2020. Descriptive statistics were produced, and both the Kruskal-Wallis test and Spearman's correlation were applied, with *P* values <0.05 considered statistically significant.

Results

Facebook, with 7002 followers, was the most popular platform, followed by Twitter (409 followers) and YouTube (199 subscribers). The primary audience consisted of sub-Saharan Africans, predominantly males aged 25 to 34 years, who mostly accessed the platforms via mobile phones. Photos and links led to more engagement across all post types, with the highest access occurring over the weekend ($P<0.001$).

Conclusions

AFAN's social media activities have effectively impacted aspiring African neurosurgeons, thanks to a strategic approach informed by analytics on social media visibility and engagement.

Keywords: neurosurgery, social media, social networking, interest group, Africa

Introduction

Social media has redefined communication, education, research, and advocacy in medicine.[1],[2] It is easily accessible, user-friendly, and engaging. Given its recent importance in medicine, it is imperative to identify the relevance of social media within the neurosurgical community.[3] For instance, Facebook (Meta Platforms, Inc., Menlo Park, CA, USA), Twitter (Twitter, Inc., San Francisco, CA, USA), and YouTube (Alphabet Inc., Mountain View, CA, USA) have been used to engage students and professionals in ongoing research and basic educational resources through weekly webinars.[4]

These platforms have also been employed to share information on upcoming Zoom (Zoom Video Communications, San Jose, CA, USA) presentations, which are recorded and later uploaded to YouTube.[5] The presentation topics can vary from basic medical sciences to virtual journal clubs. The generation and dissemination of research in neurosurgery through social media have thus increased online visibility and engagement.

Although neurosurgery has embraced social media as a communication tool,[3],[6] little is known about the social media practices of African neurosurgeons and neurosurgery interest groups. The rise in smartphone and mobile broadband usage has led to a surge in social media use among patients, trainees, and neurosurgeons.[6] Consequently, African neurosurgeons and neurosurgical societies must integrate evidence-based and context-specific social media strategies into their practices to enhance the engagement of students and professionals in ongoing research and educational opportunities, as well as to effectively disseminate information across the African neurosurgical community.

The Association of Future African Neurosurgeons (AFAN) is an interest group that fosters networking, education, and research in neurosurgery.[7] AFAN uses its social media handles—Facebook, Twitter, YouTube, WhatsApp (Meta Platforms, Inc.), and Telegram (Telegram FZ-LLC, Dubai, United Arab Emirates)—to deliver education through didactic presentations by medical students, residents, and consultant neurosurgeons, sharing knowledge. Medical students also engage in monthly online journal clubs, thereby gaining experience in critically appraising articles and journals. These activities are hosted on Zoom, and the video conferences are subsequently uploaded on YouTube for easy access.[8]

AFAN's membership has grown exponentially since its inception, from 4 members in 8 months to 460 members in 18 months.[5] This growth is partly attributable to its social media communication strategy. In this study, we evaluated the impact of AFAN's online presence on Facebook, Twitter, and YouTube to identify the key factors of a successful social media strategy for similar organizations in Africa.

Methods

AFAN Communications and Operations team

AFAN's Communications and Operations team's mission is to curate AFAN's brand and facilitate the dissemination of information both within and outside the group. The team comprises 8 members: all are medical students with a sex ratio of 1:1 and a mean age of 23 years, including 4 Cameroonians, 1 Nigerian, 1 Motswana, 1 Zambian, and 1 Congolese.

AFAN is present on 5 major social media platforms: Facebook, Twitter, YouTube, WhatsApp, and Telegram. Furthermore, the group operates a website that shares information on AFAN's research, contacts, achievements, vision, and mission.

The members are divided into teams based on the communication platform: Facebook (n=5), Twitter (n=2), YouTube (n=2), WhatsApp (n=3), Telegram (n=2), and Website (n=4). Additionally, the communication tasks are recorded on a spreadsheet using a traffic light system for accountability. This system is employed for monitoring and evaluation: red indicates an incomplete task with major problems, orange indicates an incomplete task with minor problems, and green signifies a completed task. Tasks include contacting guest speakers, designing posters, disseminating the poster on social media, and sharing the link to the YouTube video after the webinar. Programming tools, such as Google Keep, Google Calendar, and Hootsuite, are used to post scheduled content automatically.

Study design

Social media analytics data from inception through 11 September 2020 were collected from the Facebook, Twitter, and YouTube AFAN accounts. Specifically, the collection period was from 31 December 2019 through 11 September 2020 for Facebook, 9 May 2020 through 11 September 2020 for Twitter, and 6 May 2020 through 11 September 2020 for YouTube.

Data collection and ethics

The data collected included:

- Facebook: Daily new likes, daily unlikes, daily page engaged users, daily organic reach (the total number of people who see a post), daily viral impressions (page's posts featured on an unsubscribed user's screen), post type (link, status, photo, or video), and post date.
- Twitter: Tweets published, total impressions (number of times the tweet has been seen), total engagements (sum of retweets, replies, follows, likes, links, hashtags, embedded media, username, profile photo expansion, or tweet expansion), user profile clicks, follows, and tweet dates.
- YouTube: Videos, video length, watch time, total reach, total engagement, audience demographics, subscriptions, and publication date.
- The publicly available data were devoid of patient information, so the authors did not seek Institutional Review Board approval or patient consent.

Data analysis

Summary descriptive statistics were generated, and Q-Q tests were used to determine the normality of the variables' distribution. The Kruskal-Wallis test was used to determine significant associations between the Facebook post type and organic analytics (organic reach and organic impressions).

The Spearman correlation was used to evaluate the association between the number of new followers, likes, replies, retweets, and published tweets. Next, the variables that were significantly correlated with new follows were analysed using a nonparametric multivariate model. Inputs were Twitter retweets, Twitter likes, and Facebook post types. The threshold of significance was set at $P<0.05$. SPSS Statistics for Windows, version 26 (IBM Corp., Armonk, NY, USA) was used for data analysis.

Of note is that we defined impressions as the total number of people to whom our content was visible. Reach, on the other hand, referred to the number of people who chose to see our content and engage with it through likes, comments, or shares.[9]

Results

Facebook

The AFAN Facebook handle had 7002 followers as of 11 September 2020. The page had a median of 1.0 daily new likes (interquartile range [IQR], 3.0), 0 median unlikes, 28.0 median daily page users (IQR, 50.0), 446.0 median daily organic reach (IQR, 845), and 315.0 median daily viral impressions (IQR, 824.0). Of the 459 posts, photos were the most frequent (n=253, 55.1%), followed by links (n=192, 41.8%) (Figure 1). Photos had the highest median lifetime impressions ($P<0.001$) and reach ($P<0.001$) among all post types (Figure 2).

Twitter

The AFAN Twitter account was following 237 accounts and had 409 followers. It posted a median of 1.0 daily tweets (IQR, 3.0). The tweets generated a median of 676.0 impressions (IQR, 1341.0) and 35.0 engagements (IQR, 73.0). Follows were significantly associated with retweets ($P=0.01$) and likes ($P=0.02$) but not with the number of tweets published ($P=0.69$), impressions ($P=0.05$), or replies ($P=0.52$).

YouTube

Over its 4 months of existence, the AFAN YouTube channel had 199 subscribers, 14 videos, 1891 views, 26 307 impressions, a 2.0% impression click-through rate, and 164.1 watch hours. The majority of unique viewers were not subscribed to the channel (n=1249, 66.0%), all were aged 25 to 34 years (100%), and most were male (n=1537, 77.0%). The viewers were from Cameroon (n=69, 3.7%), Zambia (n=36, 1.9%), Botswana (n=33, 1.8%), the Democratic Republic of Congo (n=20, 1.1%), and the USA (n=12, 0.6%).

Viewers watched the videos on mobile phones (76.2%), computers (20.3%), tablets (3.0%), televisions (0.3%), and game consoles (0.1%). The videos totalled 72 shares: 46 (63.9%) using the 'copy to clipboard' function, 16 (22.2%) via WhatsApp, and 4 (5.6%) via Twitter.

Discussion

To the best of our knowledge, this was the first study evaluating the social media impact of a medical interest group in Africa. AFAN's social media impact improved significantly, and photo-type posts generated more impressions and engagements than videos and text.

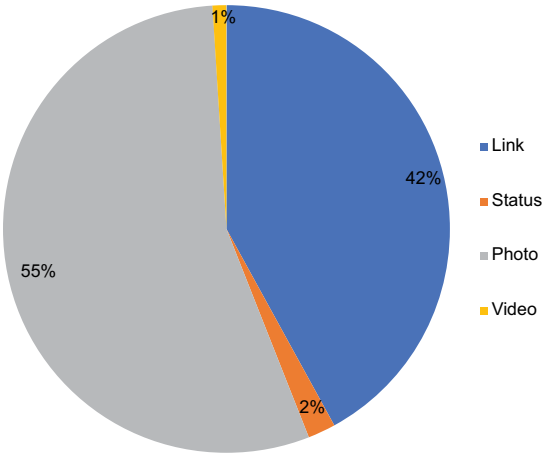

Figure 1. Types of posts on the Association of Future African Neurosurgeons (AFAN) Facebook page as of 11 September 2020 The AFAN Facebook page was created on 31 December 2019 and had 7002 followers at the time of data collection

Impact of social media on neurosurgery interest groups

Social media is an indispensable tool in neurosurgery, and the study of social media analytics is an objective method of monitoring and evaluating social media communication strategies.[10] From the data collected, neurosurgery institutions can readjust their communication strategies to meet their audience's requirements and, as a result, improve their online presence.[11] In academic neurosurgery, effective social media communication increases user interactions like URL clicks, and this translates into increased article reads and citations. For example, journals and authors with active social media accounts have significantly higher Altmetric scores than those without social media accounts.[12],[13]

Increased social media impact is dependent on the presence of a dedicated social media team and the creation of quality and targeted content.[6] The Journal of Neurosurgery Publishing Group, which is among the largest neurosurgery publishers, created a specialized social media team to boost its social media impact.[14] This team designed a strategy that led to significant increases (over 300% in every metric) in all Facebook and Twitter analytics metrics. AFAN created a dedicated social media team composed of students from across Africa. This team developed and executed a communication strategy specifically for aspiring African neurosurgeons.

Like the Journal of Neurosurgery Publishing Group's audience, AFAN's audience is interested in neurosurgery research, as well as in education and networking.[15] AFAN regularly posts invitations to participate in international research collaboratives, calls for abstract and manuscript submissions, open-access articles, scholarship and fellowship opportunities, and organizes online mentor-mentee activities. This targeted content curation might explain the rapid growth

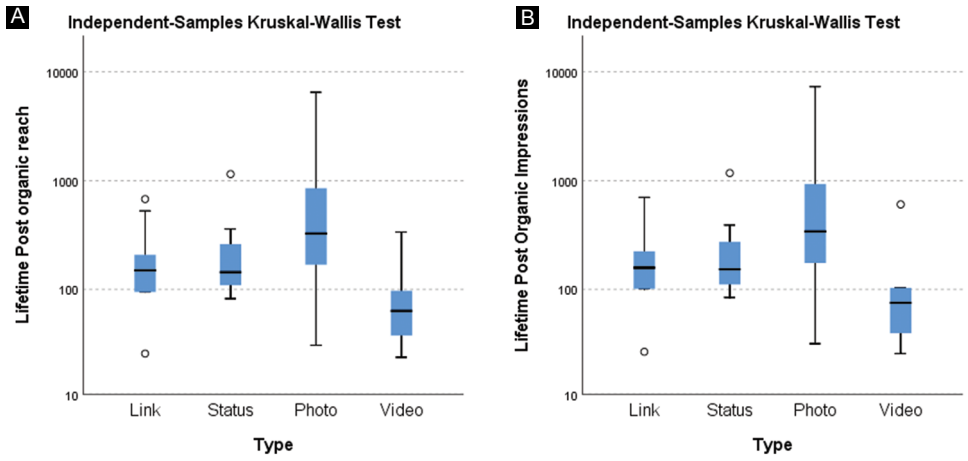

Figure 2. Visibility of Association of Future African Neurosurgeons (AFAN) Facebook posts as of 11 September 2020 The AFAN Facebook page was created on 31 December 2019 and had 7002 followers at the time of data collection, and these plots (generated using the independent-samples Kruskal–Wallis test) show (A) the lifetime organic reach (total number of unique people who have seen any content related to AFAN's page or posts) and (B) impressions (total number of times posts were seen) according to post type

of AFAN's social media followership and reach: 7002 followers on Facebook, 409 followers on Twitter, 199 subscribers on YouTube, and high combined impressions and reach. Facebook remains the leading social media platform globally, and its market share continues to increase. From August 2019 through August 2020, the proportion of African Facebook media users rose from 69.61% to 83.38%, while YouTube users decreased from 15.36% to 7.94% and Twitter users from 5.19% to 3%.[16] Despite having fewer subscribers and being newer, the AFAN YouTube handle garnered more reach and impressions than the Twitter handle. This is likely because visual aids attract attention and facilitate comprehension.[17] Interestingly, photo posts generated greater reach and impressions than video posts, which could be due to the greater volumes and cost of data associated with videos for the user.

We found no evidence that the number of social media posts was associated with impressions. However, the number of followers was significantly associated with impressions. This suggests that content quality is more important than quantity and further reinforces the need for targeted content creation. An important consideration in social media communication is the timing of posts (hour of the day and day of the week). It is generally understood that posts during nonworking hours and the weekend fare better than those during work hours and weekdays. As such, scheduling posts for an international audience can be challenging due to different time zones. Posts between 5 am and 7 pm GMT will be during work hours in at least 1 of the African time zones because Africa spans 6 time zones (from GMT−1 through GMT+4). AFAN's social media posts were not limited to nonworking hours because there is no evidence that the timing of posts influences reach and engagement in a neurosurgery audience.[4]

Perspectives for the future

Our study underscored the significance of social media analytics, a dedicated social media team, the use of photo posts and quality content, as well as the timing of posts for an organization's social media strategy. It is, therefore, vital for organizations aiming to capitalize on social media to invest time in analysing their social media analytics, develop a team committed to their social media, create high-quality content with an emphasis on the use of photos over videos, and time the publication of their posts when their audience is most receptive.

The findings from our study could assist neurosurgery interest groups seeking to increase the engagement of medical students. Our study demonstrated that aspiring African neurosurgeons are interested in neurosurgery research, neurosurgery education, and networking opportunities. Therefore, these neurosurgery interest organizations should create content around these areas to have a better impact on aspiring neurosurgeons.

Limitations

One limitation of the study was that we did not possess any data on the specific metrics resulting from individual members of the social media team using their personal accounts to comment, share, like, or enhance the visibility of AFAN's social media posts. Given the relatively high number of followers that some individual members of the social media team possess in comparison to AFAN's social media, we are reasonably confident that these actions have significantly skewed the data.

Although traditional social media engagement statistics (reactions, comments, shares, and interactions) reflect the number of users interacting with AFAN's social media posts, they do not reveal any consequent behavioural change, nor do they reveal who views, processes, or interacts with the content 'offline'—pertaining to the challenging access to fast and stable internet services in Africa—nor do they indicate behavioural change as a result of interacting with the posts.

We were unable to analyse the content of the comments on posts to gauge the quality of interaction between AFAN

social media and followers in order to gain insight into users' intent to engage.

Furthermore, even though a post may have a high number of impressions, it is difficult to tell whether they are good or bad impressions; such discernability might have been helpful in assessing the impact of individual posts.

Moreover, we did not have data on the different virtual webinars and online conferences that were conducted on Zoom, which would have helped us indicate and compare participation rates, interest, and audience engagement. These data could have helped paint a more vivid picture of AFAN's social media impact.

Confounding was inherent to the study we conducted. We did find an association between AFAN's social media activity and interest (quantified in social media metrics as the transition from reach to action, that is, having people within the African region interact with our handles or posts through likes, comments, retweets, and follows). Considering that AFAN's social media handles are some of the largest and among the first targeting aspiring African neurosurgeons, we can assume that this group lacked this kind of exposure to neurosurgical social media content before the existence of AFAN's social media presence.

Conclusions

Social media is a powerful tool for the rapid and effective dissemination of neurosurgical content, especially research and educational material. Developing a social media presence necessitates a dedicated and dynamic team, as well as an elaborate social media management strategy. Facebook is the most visited social media platform, and photo posts generate the greatest impressions. Regardless of the content, social media is crucial in promoting neurosurgery as a whole, thereby increasing reach and visibility among users, which subsequently generates more interest in the field. Future studies should evaluate the content of comments on posts to gauge the quality of interaction with followers.

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