Impact of Social Media and Virtual Learning on Cardiology During the COVID-19 Pandemic Era and Beyond

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ABSTRACT: Over the past decade, advances in digital trends and technology have greatly impacted the medical field with rapid delivery of and access to information. The field of cardiovascular medicine in particular has seen major technological advances and is well versed in the use of digital platforms and social media. In these unprecedented times of the COVID-19 pandemic, social media and other digital platforms are essential tools for communication, education, and delivery of information. In this review, we discuss the ways virtual learning and social media are changing medical education and research.

INTRODUCTION

For the past decade, digitization and smart technology have evolved in many different arenas, from engineering to medicine. In today's health care environment where learning is "on the go," access to and rapid delivery of information is essential to keep up to date on new information. This is especially true in the field of health care, where new digital trends and resources such as smartphone applications and social media (SoMe) are being used for medical education. Advances in digital trends have had a profound impact on the ability to share and learn information in cardiovascular (CV) medicine and its specialties. The coronavirus disease 2019 (COVID-19) pandemic has highlighted the need for accelerated dissemination of information and knowledge, resulting in changes that will continue to impact how we educate and learn in the future.

A TRANSITION FROM ORTHODOX LEARNING

Cardiovascular medicine has seen major technological advances in the last decade that, along with the growth of digital technology, have enabled us to transition from traditional methods of teaching to digital learning. Digital learning platforms such as online journals, guidelines and statements from national medical societies, online videos and conferences, and SoMe have had a major impact in how information is disseminated.[1] Easy access through laptops or smartphones makes learning on the go a new trend and carrying books a thing of the past. SoMe has been increasingly used in all aspects of medicine—from education and networking to public health and advocacy—and has become an important way of communicating in cardiology and sharing content from cardiology journals, societies, and national scientific conferences (Figure 1).[2,3] Twitter hashtags allow users to tag and search for related content across the SoMe platform, and cardiovascular-specific hashtags have wide digital reach. For instance, the hashtag #Cardiotwitter was used in over 50,000 tweets by more than 14,000 Twitter users in its first year (October 2017 to September 2018), with users sharing nearly 48,000 visuals and over 19,000 papers or links.[4] In the current pandemic era, SoMe and virtual education are novel dimensions to the paradigm shift in medical education that we will continue to see in the future.

IMPACT OF SOCIAL MEDIA AND VIRTUAL LEARNING IN THE COVID-19 ERA

Social Media Platforms for Education

More than 2 billion people use SoMe, with over 70% of Americans on at least one SoMe platform, and it is increasingly being used in the CV community.[4] There are numerous platforms for SoMe, including Twitter, YouTube, Facebook, WhatsApp, Instagram, podcasts, and Doximity (Figure 2).[5] As SoMe has become more popular, health care professionals increasingly turn to it for professional and educational opportunities.[6] An online survey created via SurveyMonkey was shared on Facebook by resident physicians at Houston Methodist Hospital in May 2020. At the time, 100 anonymous and random respondents, irrespective of demography and educational background, were asked: "Do you use social media as an educational tool?" and "What social media platforms do you use the most for educational purposes?" For the first question, approximately 75% responded in the affirmative. For the second question, most respondents reported using YouTube, Twitter, and Facebook as their educational outlets of choice (Figure 3). While this survey consists of a small sample size of current social media users and may not represent the larger community, it emphasizes the role social media plays in knowledge dissemination.

Figure 1.
Twitter pages of cardiology and other subspecialty organizations with the number of followers displayed (September 17, 2020).

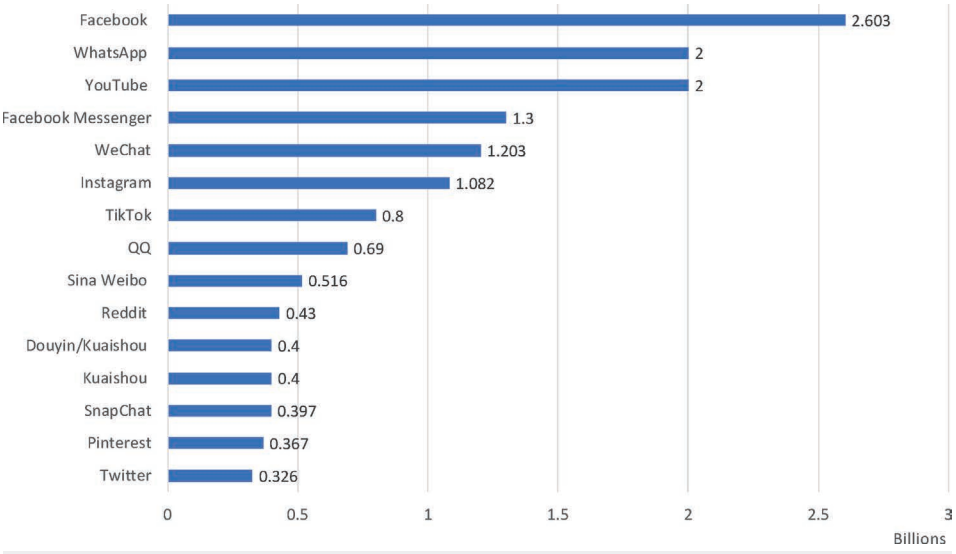

Figure 2.
Social media platforms by active monthly users (April 2020).[5]

In addition, SoMe, particularly Twitter, has been used in medical education, journals, and conferences to disseminate information and for networking, advocacy, and CV health promotion.[4,7] For example, cardiology fellows-in-training (FITs) are encouraged to use social media and share educational content through "tweetorials" using the hashtag #FITSurvivalGuide (Figure 4).[8,9] This creates a platform for free-open-access medical (FOAM) education, allows clinicians at all levels to contribute to #FOAMed, and promotes scientific discussions on late-breaking clinical trials or challenging cases.[4,10]

On March 11, 2020, the World Health Organization (WHO) declared the COVID-19 outbreak a global pandemic. Compared with prior viral outbreaks, the COVID-19 pandemic is occurring in a more digitized and socially connected world. Within weeks of the COVID-19 outbreak, SoMe and digital platforms began to rapidly spread information in what the WHO called an "infodemic," with reports of COVID-19–related tweets being shared every 45 milliseconds.[11] However, this rapid dissemination of information does not necessarily translate to accuracy. One study of 673 tweets using trending COVID-19 hashtags found that 24.8% contained inaccurate information, and 17.4% provided unverifiable information about

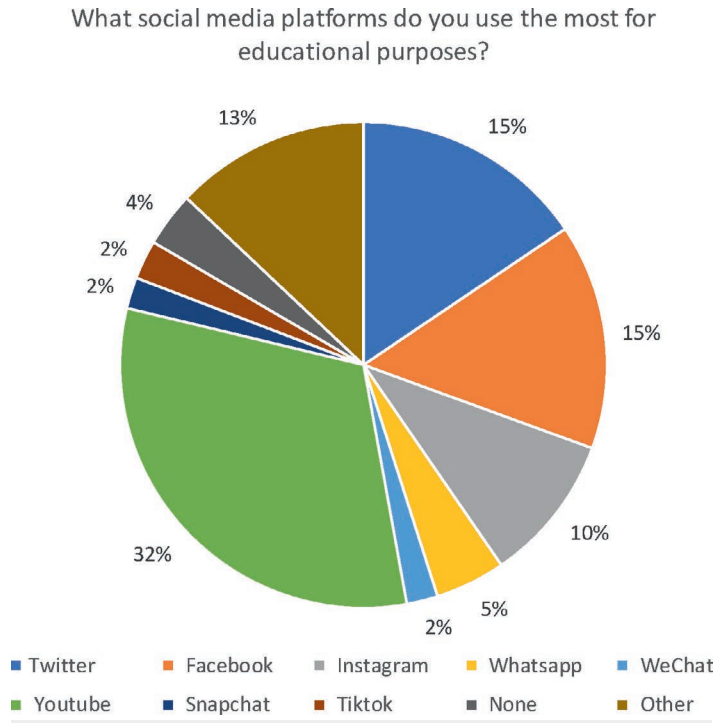

Figure 3.
Results of an online survey with 100 respondents showing preferred social media platforms used for education.

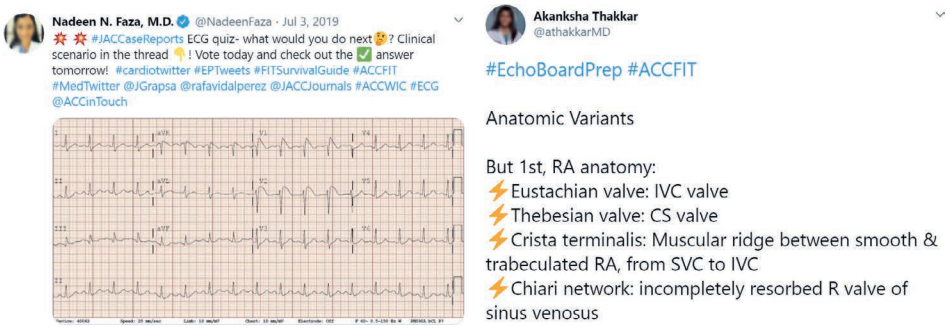

Figure 4.
Examples of tweets sharing cardiology education content with hashtags #ACCfit, #FITGurvivalGuide, #EchoBoardPrep. Printed with permission from Nadeen Faza, MD, and Ankasha Thakkar, MD.

the pandemic.[12] Due to the wealth of data and potential for misinformation leading to SoMe panic, special considerations and frameworks to help navigate SoMe have been suggested.[11-14] In the COVID-19 era, SoMe has become a tool for many countries and world leaders to research and collect infodemiology and infoveillance data (such as real-time data on "Worldometer"), analyze public concerns, communicate public health information, and even use big data and artificial intelligence for surveillance and clinical use.[15-20] Also, use of SoMe to recognize and promote research has affected strategies to increase the impact of research and citations and could even impact patient outcomes.[21-24]

Fostering meaningful education during this challenging time is difficult due to social distancing and work restrictions; however, SoMe has proven to be an effective tool to rapidly disseminate knowledge. Chan et al. demonstrated use of tools such as infographics posted on SoMe platforms such as Twitter and WeChat to educate front-line health care workers on airway management and infection control in the setting of COVID-19.[25] Rapid-fire and case-based learning are available on several SoMe platforms, such as Twitter, providing free and up-to-date information, unlike medical textbooks that often lag behind. However, social media posts are not subject to fact checking or peer review—although they are often used to share links to peer-reviewed information—so caution must be used when navigating SoMe platforms to avoid propagating misinformation.[25,26] Cautious and responsible use of SoMe has the potential to serve as an effective conduit for rapid and effective real-time communication of information (Figure 5), which will impact the way we learn in the future.[27]

Influence on Cardiovascular Societies and Research

SoMe has enabled national and regional CV societies and journals to widely disseminate content, increase journal visibility, and encourage digital engagement using digital abstracts, hashtags, and posts with questions.[4] Several CV societies and journals spanning heart failure, interventional cardiology, and CV imaging have endorsed using SoMe to learn and share information with new audiences.[27-32] Online Twitter journal clubs (eg, #JACCclub from the Journal of the American College of Cardiology, #ASEchoJC, and Twitter Live) and SoMe during national conferences have become increasingly popular ways to reach global audiences (Figure 6).[4,33] SoMe has also been used to draw attention to physician and patient

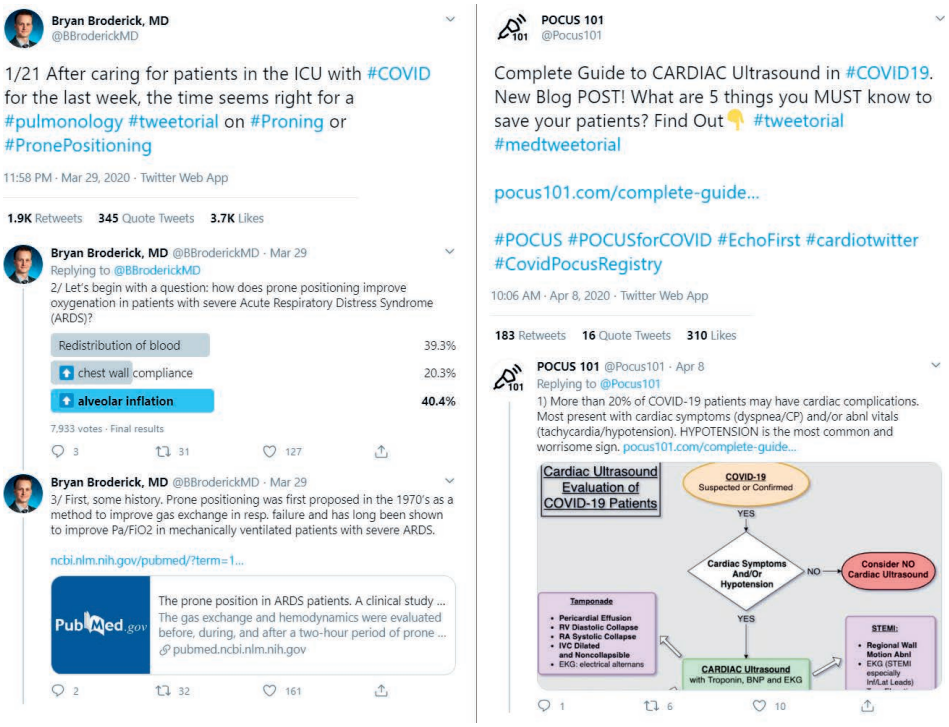

Figure 5.
Examples of Twitter COVID-19 "tweetorials." Printed with permission from Bryan Broderick, MD, and Vi Dinh, MD, pocus101.com.

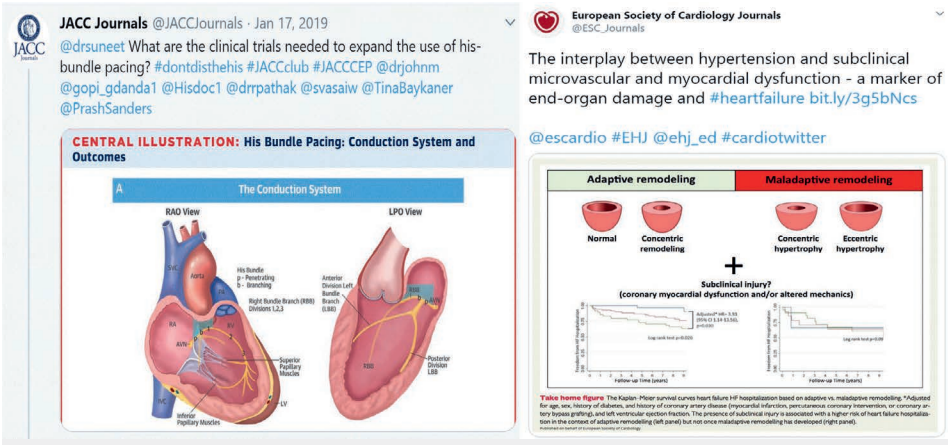

Figure 6.
Examples of journal articles posted by @JACCJournals and @ESC_Journals. Printed with permission.

advocacy and address patient education and health inequities.[33,34]

During the COVID-19 pandemic, global and national CV societies have responded to the changing protocols and need for rapid learning by implementing changes to the established guidelines according to COVID safety recommendations.[35,36] Several CV imaging societies, including the American Society of Echocardiography (ASE), Society of Cardiovascular Computed Tomography (SCCT), and American Society of Nuclear Cardiology (ASNC), have endorsed new safety guidelines and efficient protocols (ie, use of point-of-care ultrasound) during the COVID-19 pandemic to reduce potential exposure to other patients and health care providers.[37-41] The American College of Cardiology (ACC) and Society for Cardiovascular Angiography and Interventions have also released guidelines on best practices and triaging patients for coronary and structural interventions.[42,43] SoMe has been an effective and timely tool to communicate these updates and safety guidelines to a wider audience.

Impact of Virtual Learning on Current and Future Training

The COVID-19 pandemic has greatly affected medical education and training for current and future cardiovascular trainees. Several Accreditation Council for Graduate Medical Education and CV programs have been dramatically impacted and implemented changes to the cardiovascular program requirements and curriculum. In April 2020, the Beth Israel Deaconess Medical Center Fellowship Program and ACC FIT Section Leadership Counsel surveyed cardiology fellows across the United States to assess how COVID-19 affected their work and training. Of the 997 respondents, 88% of FITs reported a transition to virtual conferences, 78% noted an increase in online education content, and 73% said they were interested in complimentary online educational resources to replace traditional learning modalities.[44] Several medical training programs around the country have had to shift to virtual platforms to promote social distancing and close the gap in medical education during the pandemic.[45-47] In a time where physical proximity is discouraged, virtual learning opens up opportunities for trainees and staff at different institutions and countries to connect and collaborate regionally and globally. While the current

pandemic has challenged the way we live and learn, it has also brought up opportunities for meaningful change in the way we share and deliver information.

Similarly, national CV societies had to quickly pivot away from planned in-person gatherings for their Scientific Sessions; meetings including ACC 2020, ASE 2020, and SCCT 2020 were shifted online as novel virtual global conferences broadcasting educational sessions via videoconference. Many of these national societies have created live/on-demand virtual educational webinars and virtual cardiology board prep programs. For instance, imaging societies including ASNC, SCCT, and the Society of Cardiovascular Magnetic Resonance have implemented weekly webinars and live didactics through various e-learning platforms, such as Zoom and Webex, to continue to educate CV trainees around the world. The transition was well received—for instance, 38,006 people from 157 countries attended the 2020 virtual ACC Scientific Session[48] compared to 18,308 and 16,609 at the in-person 2016 and 2017 sessions, respectively[49]—and we may continue to see growth of virtual learning platforms for future trainees. Continuing medical education (CME) through SoMe has also been suggested as an alternative means to obtain CME due to speed of access and cost during COVID-19 and beyond.[27] In a direct response to the pandemic, many societies have devoted sections of their websites dedicated to COVID-19 resources. Even some clinical care has shifted online, with telemedicine gaining recognition as an invaluable tool for physicians to care for patients in this unprecedented time.[50] Between virtual learning platforms for physician trainees and telemedicine for patients, we may continue to see a paradigm shift in how we learn, educate, and deliver health information in the future.

LIMITATIONS OF SOCIAL MEDIA AND VIRTUAL LEARNING

Though there are several advantages of SoMe and virtual learning, one must be aware of its limitations. SoMe cannot replace hands-on learning but should be an additional resource for education and transmission of knowledge. Also, navigating the wealth of data to determine legitimate information versus misinformation can be difficult because SoMe doesn't always use peer-reviewed information or disclose conflicts of interest. Posting opinions rather than facts can lead to inaccurate information in times of pandemic, and misinformation can lead to hysteria and unnecessary effects on mental and physical well-being.[21,26] However, with cautious and responsible use, SoMe and virtual learning can be invaluable learning tools for now and the future.

CONCLUSION

The cardiology world is well connected with SoMe and virtual platforms for learning. SoMe provides a wealth of data and, with cautious navigation, is an invaluable tool for global education and rapid dissemination of information. The current COVID-19 environment has highlighted the importance of SoMe and virtual learning and accelerated the use of these digital platforms for the current times and future. Pandemic or not, SoMe and virtual learning are here to stay and will continue to be incorporated into medical education, research, and practice. However, SoMe should not be seen as a replacement for the peer-review process of publishing scientific and medical discovery.

KEY POINTS

- Social media (SoMe) is a popular platform for medical education and is used by health care professionals participating in online journal clubs, societies, and national conferences.
- SoMe is also a vital source of information dissemination via tweets, tutorials, videos, infographics, and links to articles.
- There are resources available to evaluate the validity of information on SoMe to prevent misinformation dissemination.
- The COVID-19 pandemic has led medical education and societies to pivot to virtual learning instead of in-person gatherings.

Conflict of Interest Disclosure:
The author has completed and submitted the *Methodist DeBakey Cardiovascular Journal* Conflict of Interest Statement and none were reported.

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COVID-19, social media, cardiology virtual learning

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