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REVIEW

Twitter for professional use in electrophysiology: practical guide for #EPeeps

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Abstract

Social media (SoMe) becomes more and more popular in the cardiological community. Among them, Twitter is an emerging and dynamic medium to connect, communicate and educate academic and clinical cardiologists. However, in contrast to traditional scientific communications, the content provided through SoMe is not peer-reviewed and may not necessarily always represent scientific evidence or may even be used to unjustifiably promote therapies for commercial purposes. For the unintended, this means of communication might be appear difficult to handle. This article aims to provide a practical guide on how to use Twitter efficiently for professional use to keep yourself up-to-date about new techniques, the latest study results and news presented at national or international conferences. Additionally, important limitations will be discussed.

Keywords Social media • Twitter • European Heart Rhythm Association • Education • Training • Communication • Electrophysiology

Introduction

Social media (SoMe) represents a ubiquitous medium of communication and networking in everyday life. In recent years, the value of SoMe for professional use among cardiologists has gained importance for education and training but also for diffusion of new techniques and scientific impact.[1–3] Twitter has emerged as the leading and most widely used communication channel for science dissemination and professional exchanges. Interestingly, people professionally using Twitter in the cardiovascular field are significantly older than the general Twitter population and more commonly female, which shows that Twitter is a broad public communication medium on cardiovascular diseases.[4]

There are several examples supporting the impact of SoMe in the medical field.[5] A shift in continuous medical education pathways from traditional face-to-face journal clubs to Twitter journal clubs has been described.[6,7] Post-publication peer-review on SoMe is also gaining importance and has recently even led to paper retractions and corrections.[8] Several studies have documented the scientific impact of SoMe on journal and article metrics.[9–13] Moreover, there is a considerable and increasing Twitter activity at major cardiology congresses involving Twitter ambassadors.[14–15]

Twitter is also increasingly used to disseminate and develop new treatment technologies. Hashtags like #ldtra (left distal transradial) or #radialfirst initiated a paradigm shift in interventional cardiology regarding the standard access for coronary angiograms. In the field of cardiac pacing the further development and clinical uptake of the concept of physiological pacing is flanked by active discussions on SoMe. For example in the case of His-bundle pacing, the hashtag #dontdisthehis spread rapidly to congresses and training events, which creates now the basis for several randomized controlled trials.[16] The #NoReformat movement was also distributed via Twitter and supported initial style-independent submissions to scientific journals that now has been widely implemented, e.g. *EP Europace* (link to

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the tweet: https://twitter.com/ABollmannMD/status/1301122472197206018).

In this article, a practical guide for how to use Twitter in order to interact and participate as an electrophysiologist on SoMe is provided. Additionally, Twitter activities on conferences and around journals of the *European Society of Cardiology* (ESC) with focus on *EP Europace* and in particular of the European Heart Rhythm Association (EHRA) are presented.

How to develop an own Twitter profile?

Anybody can create an individual profile on Twitter. The profile on Twitter is called 'handle' and can be mentioned in a tweet by an '@' sign (e.g. @EHRAPresident). On SoMe, the own profile is formed by what is published ('posted') under the particular handle. Therefore, the own identity should be used and the tone of the tweets should be scientifically valid and rigour, professional, respectful, and friendly. It is not only important what is tweeted but also the personality that is behind the Twitter handle.

When setting up an own Twitter profile, a professional photo, a description of the own work and the institution weblink or the own website link should be added. In the description also hashtags for the own areas of expertise and/or interest can be mentioned and an own tweet which should be highlighted when people visit the profile can be pinned at the top of the profile. Of note, many employers now have a clear 'SoMe' policy, and users should acquaint themselves with this before using Twitter.

How to engage within the European Heart Rhythm Association Twitter community

To engage within the EHRA Twitter community, tweets can be liked, retweeted and commented. To agree and endorse a message communicated in a tweet, the 'like' function can be used. By retweeting (retweet function) a tweet, tweets are shared with the own followers with or without a comment.

By following a handle, Twitter users are regularly informed about tweets which will appear in the own private timeline, which can be organized as a chronologic or top-based timeline. The most important functionality of Twitter is summarized in *Figure 1*.

How to build a tweet

A tweet is an extremely short message and it is often a challenge to communicate a thought in only 280 characters. However, even shorter tweets (71–100 characters) often gain most re-tweets. Therefore, it is advisable to go to the point and to the key message, be catchy and start the post with the most interesting information. Try to be timely and post the new science from the own Twitter account. Identify new and hot topics impacting daily practice. Adding a personal note will help followers relate to the person who is behind the Twitter handle.

To spread the message more widely, the most popular hashtags ('#') should be identified and used. Hashtags (e.g. #EHRA_ESC, #EUROPACE, or #EHRA_Ecomm) indicate a word or short phrase in a tweet that allows cross-referencing on a specific topic. They are usually included directly in the text of the tweet. The use of hashtags can support in generating a personal archive of tweets. Formulations such as 'Follow #EHRA_EComm' can be used to catch someone's attention for the own hashtag. Do not overuse hashtags (max 4#s per post).

Twitter handles of other persons (e.g. colleagues, authors, co-authors, peers, and influencers) can be mentioned in a tweet to involve them in a discussion. If many people should be added, up to 10 handles can be 'tagged' to an image (not possible for a video). Expressions such as 'please retweet' can stimulate people to interact with the own tweet.

Twitter handles and hashtags related to the ESC and EHRA are summarized in *Table 1*. A list of hashtags associated with electrophysiology is presented in Supplementary material online, *Table S1*.

How to cite a manuscript or how to add a photo/video

To post or comment on scientific content or to promote a publication, the URL link to the resource/reference that supports the statement can be added to the tweet where applicable. URL addresses are often very long. However, Twitter applies 23 characters to all links posted, regardless of their length, thereby facilitatingto stay inside the character limit. Alternatively, the link to a respective article can be shared directly from the journal website via the 'Share' function. Additionally, the Twitter handle of the authors, as well as the Journal handle and hashtag (e.g. @ESC_Journals and #Europace) can be mentioned.

Adding illustrative pictures (as URL or added directly) or visuals (images/video/gif) can substantially enhance the reach of the tweet. Up to four images can be uploaded per tweet. Videos can be added and uploaded in the MP4 or MOV format with a maximal length of 2.20 min. While tweeting, possible copyright infringements may apply, particularly when screenshots of published articles are used which may be protected by a paywall.

By using 'www.allmytweets.net' it is possible to export all Tweets as a PDF file. Specific articles can be found by searching for a word or a hashtag and tweeting becomes an important archival method.

How to stimulate interactions?

Healthy debates can be sparked, questions by mentioning peers can be asked and the own take on recent publications, trials or interesting cases can be tweeted.

Tweetorials are often used to present educational practical guides for, e.g. a puncture technique, or an instruction for statistical data analysis. Additionally, overviews of current guidelines are presented on Twitter as a tweetorial (Link to the tweet: https://twitter.com/EHRAPresident/status/1320648874571300864). A series of tweets (max. 25) can be linked through a 'Twitter thread'. Threads and tweetorials represent an opportunity to publish longer contributions on

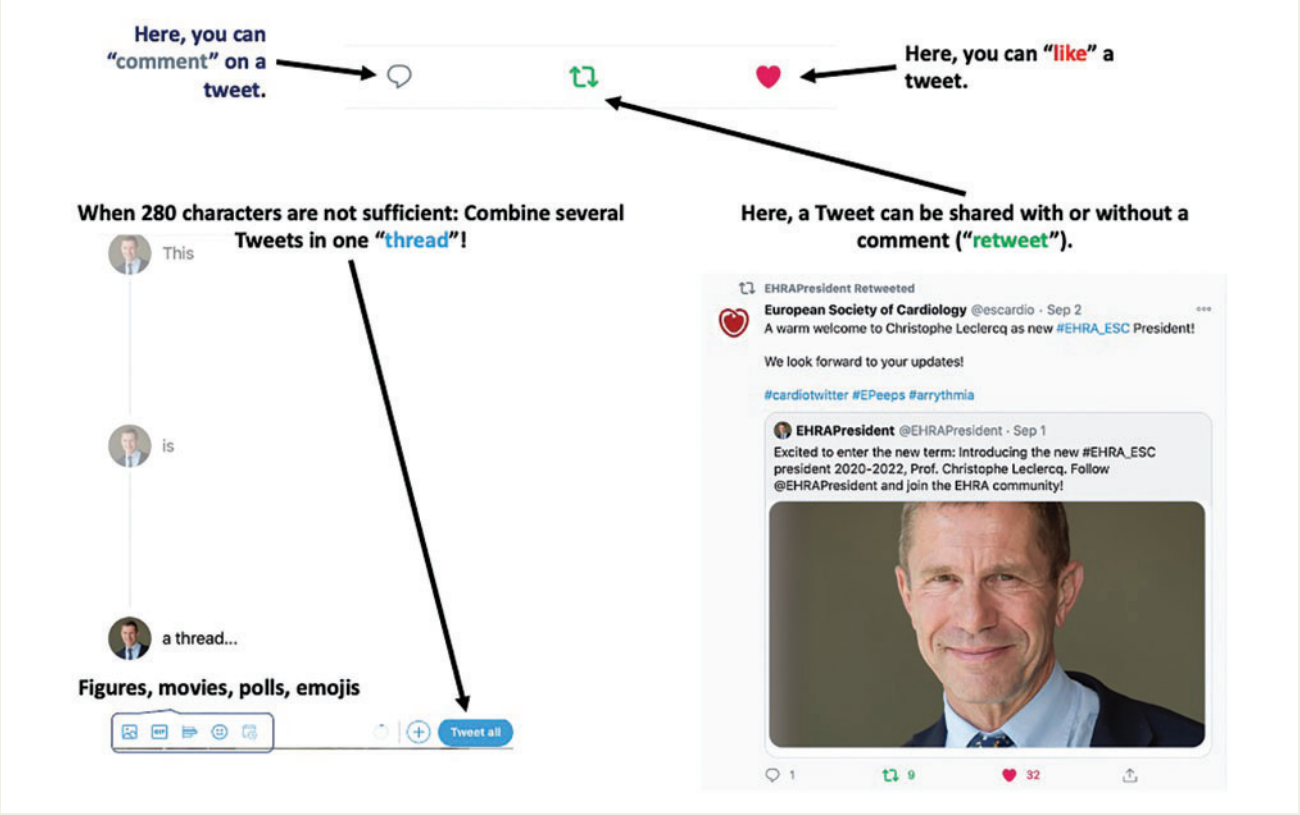

Figure 1 Main features of a Twitter profile.

Twitter. The (free) website @threadreaderapp can be used to create one easily readable document from a whole thread.

A targeted interaction and engagement with the community can be initiated by a poll. After completion of the poll, the result should be summarized in a follow-up tweet referencing (retweeting with comment) the initial tweet.

Interaction is one of the main goals of Twitter. However, engage with own peers but refrain from interacting with/giving advice to patients. Double-check the post content before posting to avoid spelling/broken links/other mistakes. Additionally, do not post identifiable patient details and if posting cases, patient consent should be requested. SoMe posts are in the public domain, and although it may be possible to delete the own posts later, considerable harm and controversy can ensue before that is done.

Table 1 Twitter handles and hashtags related to the ESC and EHRA on Twitter

EHRA-specific handle	EHRA-specific hashtags
@EHRAPresident	#EHRA_ESC
	#Europace
	#EHRA_EComm
	#YoungEP
General ESC handles	**General ESC hashtags**
@escardio	#ESCCongress
@ESCAdvocacy	#ESCGuidelines
@ESCCardioNews	#ESCDigital
@ESC_Journals	#ESCYoung
	#ESCDigitalWeek

ESC, European Society of Cardiology; EHRA, European Heart Rhythm Association.

The best time to tweet?

Twitter is a fast moving SoMe platform. The medium lifespan of a tweet is ~18 min. This means that an individual tweet just has a time window of 18 min to get seen. Therefore, repeated posting of content (e.g. at 9 am, 12 am, 3 pm, and 6 pm) increases the chances of appearing in peoples' timeline. The optimal timepoint posting a tweet may depend on the target group. Additionally, possible time differences need to be considered. The most popular and best times to tweet for engagement differ across time zones, so it is still important to experiment and find the times when the own audience is most engaged.

If tweeting about an exciting clinical case, the following points should be considered: Twitter is a public medium. Never post about the own case the same day, as patients and families may follow the own handle on Twitter. Make sure not to post identifiable data. Public discussions with patients should be avoided.

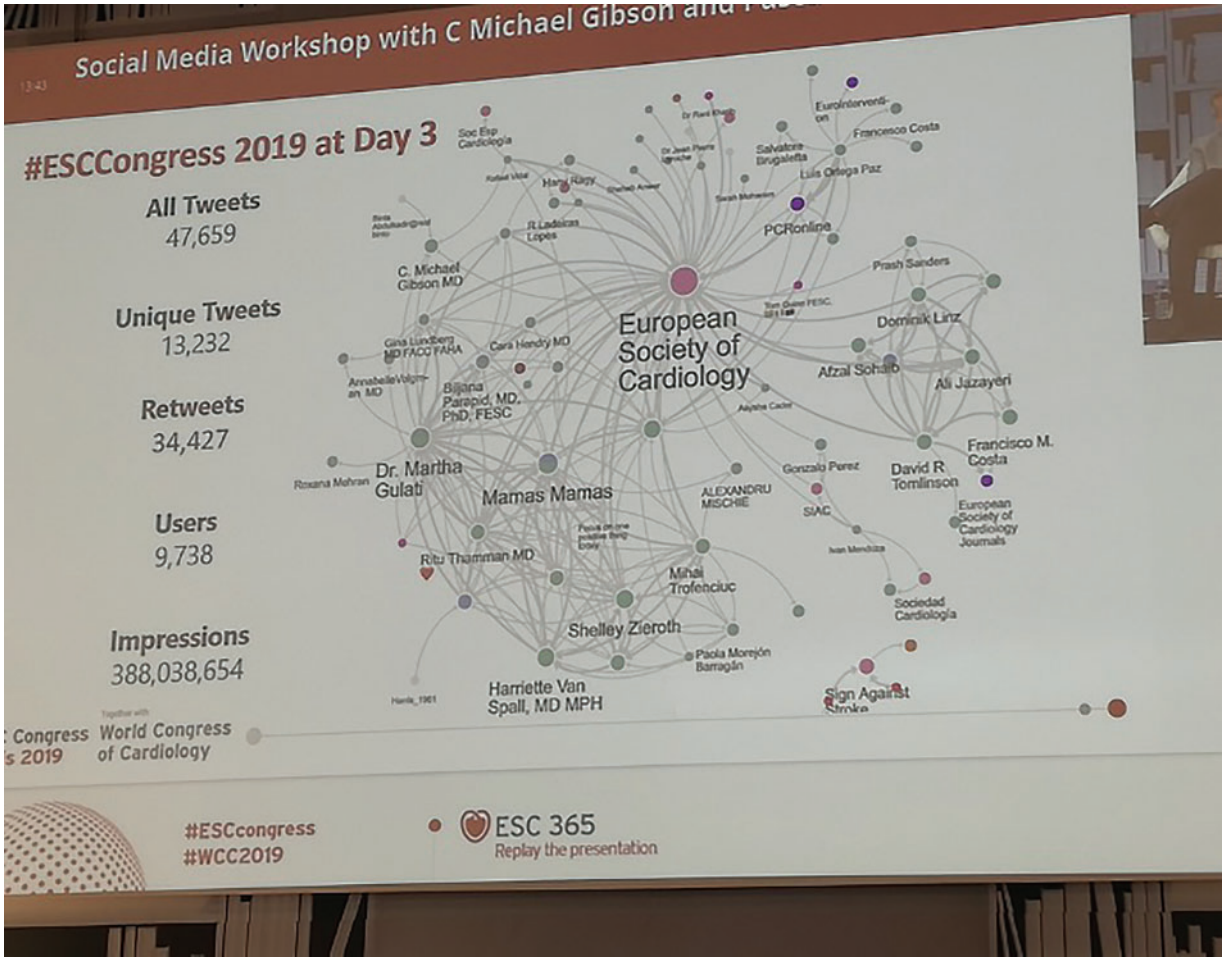

Figure 2 Representative analytic map derived from data collected during the ESC Congress 2019 showing Twitter activities around ESC Congresses. ESC, European Society of Cardiology.

Twitter ambassadors

Data from ESC Congress 2018 show that 81% of the tweets include congress-related educational content, only 5% actually show 'social' aspects.[12] The widespread interactions resulting from Twitter activities around ESC Congresses is shown in a representative analytic map derived from data collected during the ESC Congress 2019 (*Figure 2*). Before large ESC conferences, official ESC Twitter Ambassadors are appointed to provide real-time coverage of the meeting through their own channels, as well as via @escardio, using the hashtags #ESCCongress, #ESCDigital, and #ESCGuidelines. During ESC Congress 2020, 51 ambassadors, including ESC Social Media Ambassadors and ESC Twitter Ambassadors, generated content and engaged with followers. ESC Twitter Ambassadors were grouped into 13 teams based on ESC Congress topics and assigned to cover sessions based on their expertise and availability. Everyone was encouraged to make the content engaging—not just straightforward live-tweeting but also using threads and polls or sharing their 'social' photos. During the ESC Congress 2020, the #ESCCongress hashtag was mentioned in 61.4 thousand tweets published by 12.7 thousand unique users. This resulted in 355 million impressions on Twitter, which is a total tally of all the times the respective Tweets appeared on individual timelines or searches on Twitter. Engagements represent the number of times that a given Tweet was engaged upon by the viewers, which includes, but is not limited to, retweets, favourites, replies, URL clicks, hashtag clicks, mention clicks, and media views. Media engagements accordingly mean the subgroup of engagements on media content. Additionally, a Twitter Party was broadcast live on ESC Twitter, a Twitter Chat was organized, and the Twitter Highlights were regularly published on Twitter (To find the tweets of the ESC Congress follow #ESCCongress on Twitter).

European Heart Rhythm Association e-Communication committee

The EHRA e-Communication committee (#EHRA_EComm) is a part of the Advocacy Pillar of EHRA. The mission is to optimize the communication of EHRA and its mission to members, non-members,

Figure 3 The EHRA e-Communication committee 2020–2022 and the QR-code directly connecting to the EHRA president handle (@EHRAPresident). EHRA, European Heart Rhythm Association.

healthcare providers, and patients and to recognize the leading position and source of information for heart rhythm disorders in Europe (more details: https://bit.ly/3jq9Yr1). Additionally, the EHRA e-Communication committee acts as an EHRA Ambassador to promote EHRA educational activities, science, and membership. Twitter is used as one main communication channel (*Figure 3*).

Twitter from the *EP Europace* perspective

Several studies document the scientific impact of SoMe on journal and article metrics. About 10% of the articles indexed in PubMed get tweeted at least once.[9] While the impact of SoMe on scientific publications in Circulation was rather low in 2013–2014,[10] it has gained more and more importance in recent years. The value and impact journals are not only assessed by the impact factor but also the Altmetric score, which correlates with citations in cardiovascular articles.[11]

In a recently published preliminary analysis from the ESC Journals Randomized Study, the authors systematically randomized papers published in the ESC journals family from March 2018 to May 2019 to a Twitter arm (for promotion on Twitter) or to a control arm without tweeting activity from ESC channels. In this preliminary analysis of the first 536 papers, Twitter promotion of articles was associated with a 1.43 higher citation rate (primary endpoint), independently of the article type.[12]

Most journals now involve SoMe editors. For instance, the ESC Journals' family has appointed one SoMe editor per journal. One of the tasks is to prepare a weekly tweet which is shared via @ESC_Journals every weekday @11 am (CET); for *EP Europace* on Wednesdays. Importantly, this article is then #freeaccess for 24 h. Between 16 October 2019 and 28 October 2020 ('Covid-19 break' between March and June 2020), 38 Tweets about *Europace* publications were published, which resulted in a median number of 12 737 (range: 3531–25 266) impressions, 30 (range: 6–150) likes, 15 (range: 3–58) retweets, and 62 (range: 10–344) Link clicks. Examples of representative tweets by the @ESC_Journals handle (@ESC_Journals) on *EP Europace* publications are shown in *Table 2*. Similar to many other journals, *EP Europace* asks the authors to provide a text for a Tweet about their submitted articles and Twitter handles of authors. Authors can thereby benefit from a wide and timely dissemination of their manuscript once published online. Especially for authors less engaged in SoMe (yet), this can help increasing visibility of their work.

Strengths and limitations of Twitter

It is important to be aware of strengths and limitations of Twitter for professional use and both should be carefully weighed before tackling a professional Twitter activity (*Table 3*).

Twitter represents an up-to-date and fast platform for professional information, education, training, and scientific interaction. One aspect of the nature of SoMe is immediate transmission of a large amount of information. Thinking of scientific dissemination, this can accelerate the spread of scientific innovation, evidence or guideline recommendations. Additionally, Twitter provides a platform for public and immediate discussion. Much more than by scientific letters in journals, experts can interact and discuss without the delay by journal submissions. This discussion is open and accessible to everybody connecting to the particular platform, which surmounts several limitations of traditional and journal-based submission and discussion pathways.

However, it is important to be aware of the limitations when engaging in SoMe. Each Twitter user chooses the content he is provided by the accounts which are followed, which may result in a filtered and individualized information supply, with some potential 'Follower-bias'. Additionally, some topics may be important but not suitable or not able to be communicated through SoMe, which may contribute to a potential 'posting bias'.

Table 2 **Representative tweets by the ESC journals handle (@ESC_Journals) about *EP Europace* publications**

Tweet	Link	Article	Impressions	Engagement	Media engagement	Link clicks	Likes	Detail expands	Retweets
Learn about teleconsultation in #afib in this #Europace paper: https://bit.ly/2R3X06A #TeleCheckAF #cardiotwitter @GerdHindricks @ABollmannMD	https://twitter.com/ESC_Journals/status/1303619180525444416	https://academic.oup.com/europace/advance-article/doi/10.1093/europace/euaa201/5901680	14 116	416	201	39	35	106	17
#Telehealth and #arrhythmia monitoring during and after a #pandemic. Learn more in this practice update just published in #Europace: https://bit.ly/2ZyDSIO @GerdHindricks @ABollmannMD	https://twitter.com/ESC_Journals/status/1306155954149433344	https://academic.oup.com/europace/advance-article/doi/10.1093/europace/euaa187/5855898	14 066	301	119	29	30	95	15
#Mobilehealth applications for the detection of #afib: https://bit.ly/3o3fwLR @GerdHindricks @ABollmannMD #Europace #EHRA_ESC #ESCDigital	https://twitter.com/ESC_Journals/status/1318839804835102720	https://academic.oup.com/europace/advance-article-abstract/doi/10.1093/europace/euaa139/5920895	19 546	908	546	80	57	158	39

ESC, European Society of Cardiology.

Table 3 Strengths and limitations of Twitter for professional use in electrophysiology

	Strengths	Limitations
Immediate information	Can accelerate spreading scientific innovation, evidence, guideline recommendations, new techniques	Truncated information (280 characters) for rather complex correlations
Open access	Democratic approach, open discussion	No identification of conflicts of interest
Content	Individualized content provided	Follower bias (selection of followed handles)
Community	Easy connection between juniors and seniors, interdisciplinary discussions	Not restricted to colleagues (patients, employers, politicians, etc.)
Time	Short turn-over times, fast acquisition of new information	Is time consuming, net-benefit of SoMe engagement remains unproven
Scientific impact	Strong impact on dissemination of new information, facilitation of national/international networking, staying in touch	No peer-review
Involvement	Active or passive user	Impact and visibility on social media do not necessarily equate with scientific impact ('Kardashian-index')

In contrast to scientific journals, the content provided through SoMe is not peer-reviewed. Therefore, tweet activities may not necessarily reflect scientific evidence in support of a particular concept or therapy and may even be used to unjustifiably promote therapies for commercial purposes. It can sometimes be challenging to differentiate between facts and fiction or between scientific evidence and personal beliefs, especially when the information provided is condensed to short postings of 280 characters. Usually, a balanced discussion of complex correlations requires more elaborated and longer presentation. Another basic rule of scientific rule does not apply for activity in SoMe: declaration of potential conflicts of interest. Additionally, content on SoMe also circulates outside the traditional circles of academic medicine, which may distort the message along the way. Scientific debates and discussions therefore need to be professional, respectful, and based on scientific data.

Although one's Twitter account may be personal, it is not 'private'. Since Twitter is a public platform open to everybody, it is not only accessible for the scientific or professional community but can also be read, forwarded, or commented by private persons, patients, employers, politicians, etc. It is important to realize, that also our patients may follow us on Twitter and read our posts, thoughts, and discussions.

Scientific success should certainly not be measured solely on the basis of SoMe activities or numbers of posts. The relation between actual scientific influence (mainly through publications) and the number of Twitter followers can be assessed by the Kardashian index (*K*-index).[17] A good summary of the Kardashian index is: Being famous because of being famous. The *K*-index is calculated by *Ft*/*F*, where *Ft* represents the actual number of followers on Twitter and *F* the number of followers that the scientist should have based on the physician's number of citations (*F* is calculated here as: $F = 43.3 \times C^{0.32}$, where *C* represents the number of citations).[18] The Kardashian index can be calculated here: https://bit.ly/3eWyRdr. A *K*-index of >5 is a warning to the community that researcher X may have built their public profile on shaky foundations, while a very low *K*-index suggests that a scientist is being undervalued on SoMe. Those people whose *K*-index is >5 can be considered 'Science Kardashians' and shows that the SoMe impact for these scientists exceeds the actual scientific impact. Most cardiologists show a *K*-index of 0–2. Importantly, the *K*-index is no established scientific metric and has several potential limitations. For example the *K*-index is worked out on the number of citations (per author) on Google scholar, which reflects the total number of citations, rather than on citations specific to the particular research topic.

SoMe or instant messaging groups like WhatsApp can deliver important teaching opportunities but cannot completely replace education.[19] In a prospective randomized study in anaesthesiology residents, the use of instant messaging was associated with worse clinical reasoning despite better global appreciation, potentially due to distraction by smartphone use during the learning process.[20]

Conclusions

SoMe, particularly Twitter, is now regularly used by the ESC to communicate about activities during conferences and around journals. The EHRA e-Communication committee, the EHRA SoMe ambassadors and the *EP Europace* SoMe editors are coordinating the main SoMe activities. However, information communicated via SoMe needs to be handled with caution, as the content provided is not peer-reviewed and may not necessarily represent scientific evidence. This practical guide for the professional use of Twitter in electrophysiology summarizes the EHRA SoMe activities and provides tricks and tools how to interact and participate on Twitter as an electrophysiologist.

Supplementary material

Supplementary material is available at *Europace* online.

Conflict of interest: none declared.

Data availability

Data available on reasonable request.

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