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It is time for Turkish Cardiologists to start engaging on Twitter:

Türk Kardiyologlar için Twitter kullanma vakti

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Social media is defined as the electronic communication platform through which people from all around the world can share ideas, personal information, and other contents. Its dynamic nature and instant availability via our mobile devices have changed not only the way we communicate with other people, but also the way of education and learning. According to a recent report, 77% of adults between ages 30 to 49 use social media in 2015, compared with only 8% in 2005.

Twitter is one of the social media microblogging platforms that allows its users to post tweets limited to 240 characters. Every user has a unique Twitter handle, or username, with a prefix "@" (e.g. @TKDsosyal) and topics can be referred to or searched by using a hashtag "#" (e.g. #Cardiotwitter). Since Twitter's foundation in 2006, it has become popular among different sectors including politics, business, and academia due to its ability to rapidly disseminate new information and provide a platform for debates. It has now more than 320 million monthly active users, with more than 80% of the users from outside the United States. Among healthcare providers, most cardiologists embraced Twitter as a new way of education and communicating. Recently published papers and challenging cases are discussed, findings from major cardiovascular (CV) meetings are broadcasted in real-time, new collaborations are formed and interactions with patients and patient-advocates became much easier. In a recent paper that analyzed the volume and content of Tweets associated with cardiovascular diseases (CVD) during the period from July 2009 to February 2015, Sinnenberg et al.[1] identified 4.9 million Tweets associated with CVD of which 550338 were in English. Diabetes and myocardial infarction were the most frequently used terms, and major themes included CV risk factors and awareness. Importantly, peak rate of tweets reflected the time of major CV-related events such as the World Diabetes Day. In August 2018 Turkish Society of Cardiology (TSC) created a Twitter handle @TKDSosyal, with the goals of posting updates from cardiology literature, news from major meetings and

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interesting cases. By February 2019, it acquired more than a thousand followers, averaging more than 400k impressions monthly.

In this manuscript, we will discuss how healthcare providers can benefit from engaging in social media platforms such as Twitter and possible strategies to address potential pitfalls. We also aim to provide a brief guide for new users on how to get started on Twitter.

Engagement to recent literature from major journals and scientific conferences

Twitter offers a unique platform that information can disseminate rapidly and widely. Any cardiologist with internet access can simultaneously be informed about the results of a late-breaking clinical trial presented in a major cardiology conference and can engage in live discussions on a recently published study in a major journal.

Most of the major CV journals now have a presence on Twitter, which makes their content more accessible, and disseminated to a wider audience. There are conflicting results on the impact of social media exposure of original articles regarding their readability[2,3] and further studies are needed to prove its use on this. However, two major advantages of Twitter are already witnessed by cardiologists: Critical appraisal and post-publication review.

The results of ORBITA trial were announced during the Transcatheter Cardiovascular Therapeutics (TCT) 2017 Conference in Denver, USA. Within several hours after the presentation, ORBITA has become one of the most popular trials ever in cardiology by the virtue of rapid dissemination through social media. Statisticians discussed the gaps in methodology, clinicians analyzed and compared the results with their own real-life experiences. Mini-tutorials were posted for trainees to provide a better perspective on the methodology, statistical aspects and clinical implementation of the trial. Some welcomed and some criticized the trial, but Twitter provided a unique platform for cardiologists to come forward and speak up. Following ORBITA, multiple other trials including ISCHEMIA, CABANA, and CASTLE-AF have been critically appraised similarly in Twitter.

Editorial letters are the traditional way of the post-publication review process but only a limited number of letters can be accepted by journals, and the significant time lag for the publication of such letters is considered a major disadvantage. Recently, a meta-analysis that underwent peer review by a major journal, got retracted due to the inclusion of multiple inappropriate studies when two statisticians, Ricky Turgeon (@Ricky_Turgeon) and Andrew Althouse (@ADAlthousePhD), raised their concerns on Twitter. After evaluating their comments, the journal issued a retraction letter within 27 days of online-first publication.[4]

Attending major CV conferences is not always feasible due to time and financial limitations. Societies including European Society of Cardiology (ESC), American Heart Association (AHA), and American College of Cardiology (ACC) embraced Twitter's role in sharing of knowledge in their associated journals as well as scientific sessions. During the ESC Congress in 2018, the official hashtag #ESCCongress was used in 56823 tweets by 12156

attendees and most of those tweets (81%) contained conference-related educational information.[5] Similar results were obtained from ACC, Heart Rhythm Society (HRS) and TCT Congresses. A recent analysis revealed that despite the relatively stable number of attendees, tweet volume that is related predominantly to the scientific content increased 3.2 fold over 3 years.[6] It is likely that Twitter will continue to serve as a communication tool promoting educational and research endeavors during major CV events in the upcoming years.

Staying updated on advances in clinical practice

Mintu Turakhia (@leftbundle) from Stanford University created a poll on Twitter asking people if they changed their practice based solely on what they saw on Twitter. Among 566 participants, 62% responded positively. Although this was merely a survey on social media, with potentially a biased participant population, Twitter can be seen as a good influence to direct one in improving his/her clinical skills.

Deshmukh et al.[7] introduced a novel technique of permanent His bundle pacing (HBP) in humans in 2000. Since then HBP was poorly adopted by cardiologists despite its great potential in physiologic pacing, potentially due to the poor support from the device manufacturers and challenges in implantation techniques. Pioneers in HBP, Dr. Gopi Dandamudi (@gopi_gdanda1) and Dr. Pugal Vijayaraman (@Hisdoc1), created a hashtag (#dontdisthehis) to share their experiences and recent developments on the techniques of HBP. This generated a viral discussion platform on Twitter where clinicians were able to get tips on HBP implantation techniques and share their own cases to generate even higher excitement about this old concept of physiologic pacing. It is widely accepted that HBP would not have become popular, without Twitter's role in disseminating the cases and the excitement on this subject. Recently, the Journal of American College of Cardiology (@JACCJournals) organized one of the first online Journal Clubs on Twitter, on HBP, with the participation of the pioneers in the field as discussants, making it a unique opportunity for anyone to engage in the discussions and ask questions to these experts.

Similar to HBP, interventional cardiologists who adopted a preferential radial artery access for cardiac catheterization created the hashtag #radialfirst to promote the technique, and to help others to improve their skills, making it possible to get advice from Dr. Ferdinand Kiemeneij (@ferdikiem) who is universally known as the father of radial approach. Twitter-based learning also popularized the left distal transradial approach (#ldTRA) for access. It is not uncommon these days to witness a thumbs-up photo of a patient with the sheath still inserted in his snuffbox.

Network and collaboration opportunities

Instant sharing of cases, discussions on the recent literature and the presence of academic cardiologists on Twitter can lead to fruitful collaborations and network opportunities.

Dr. Joshua M. Cooper (@narrowQRS), a faculty member at Temple University, posted an interesting case of atrial tachycardia in a patient with previous lung transplantation. He was highly encouraged on Twitter to publish this interesting case. Dr. Tina Baykaner

(@TinaBaykaner) who was then a trainee at Stanford University, reached out to him through Twitter that started a virtual collaboration to put together the data. The case was recently published in Heart Rhythm Case Reports journal[8] and two authors later met in person at an international conference.

Dr. Joshua M. Cooper took part in another Twitter-initiated collaboration with Dr. Tahmeed Contractor (@TahmeedC). They published an editorial for a case report[9] that passed through the traditional peer-review process but could not hide from the post-publication peer-review process on #cardiotwitter.

These days it is not surprising to witness dialogues among cardiologists who solely know one another through Twitter, to make an attempt to introduce themselves in-person to each other during major cardiovascular conferences.

Challenges and pitfalls

Sharing of an incredible amount of information through social media comes with pitfalls. Medical misinformation is defined as the information that is currently false or not evidence-based. It is important to acknowledge that the dissemination of medical misinformation is a major threat not only for public health but also for academic cardiologists. Importantly, there is mounting evidence suggesting that misinformation spreads more easily online.[10] This is exemplified by social media posts promoting anti-vaccination that led to a significant increase in the incidence of vaccine-preventable diseases, which have not been seen for decades. In addition, Twitter lacks the peer-review process, which is thought as the major traditional defense to prevent medical misinformation. Therefore, it is of utmost importance to create an interdisciplinary platform comprised of public health organizations, medical professionals and patient advocates to address preventing medical misinformation. Recently, the American College of Physicians of State Medical Boards published a joint statement on maintaining professionalism on web-based applications and platforms.[11] Many local and national health organizations, as well as hospitals, publish similar statements to guide their employees on social media. On the other hand, prudent and responsible academic cardiologists and health influencers are crucial to react promptly to health-related misinformation. The editors-in-chief of several major cardiovascular journals published a joint editorial titled; “Vet the message”, pointing what is at stake by highlighting the bad experiences with anti-vaccine and statin-related misinformation.[12]

Another major concern about sharing data on social media platforms is ignoring patient privacy. It is not uncommon to see the identity and even the photo of patients in certain health-related Tweets. Patient identifiers should carefully be removed or anonymized for both ethical and legal liabilities.

The ease of sharing and facing a high volume of information through social media can often make it difficult to identify and absorb the information that is deemed necessary and valuable. If we hope to be drinking from a firehose, with an enormous amount of data at our fingertips, we should develop strategies to manage its flow. Following hashtags of interest, and following trusted journals and trusted peers are potentially helpful mechanisms to

overcome the abundance of data. It should be kept in mind that it can also harm if one always looks at just one side. Therefore, following trusted peers should not mean just to follow the ones that you agree with all the time.

Abbreviations:

ACC	American College of Cardiology
CV	Cardiovascular
CVD	Cardiovascular diseases
ESC	European Society of Cardiology
HBP	His bundle pacing
TCT	Transcatheter Cardiovascular Therapeutics
TSC	Turkish Society of Cardiology

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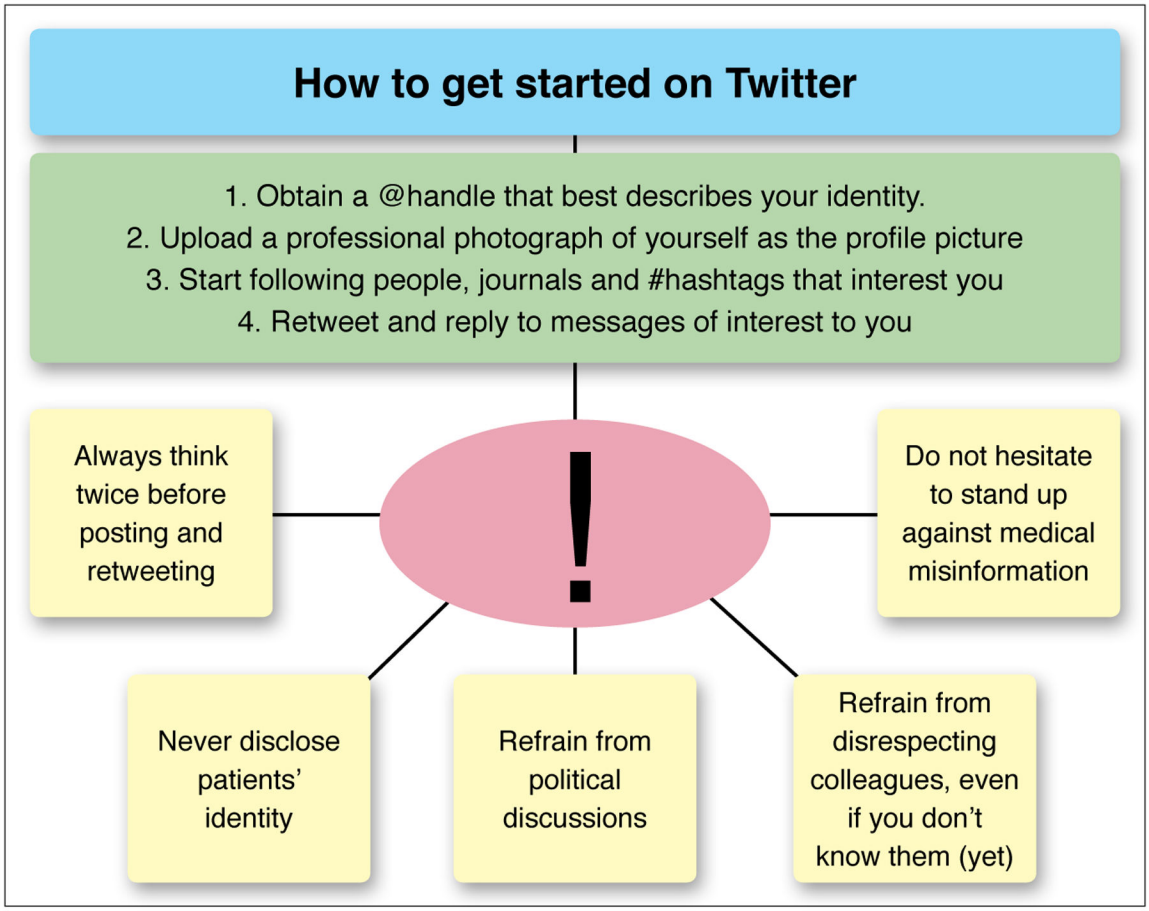

Figure 1.
Guideline.