

NARRATIVE REVIEW

In a digitally connected world through Likes, Hashtags and Followers — Advancing surgical research through a social media: A narrative review

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Abstract

In this era of modern information technology, the world is now digitally connected through various platforms on social media, which has changed the way medical professionals work, communicate and learn. The use of social media in surgery is expanding, and it is now becoming an essential tool for surgical training, research and networking. Articles, journal clubs and surgical conferences are within reach of everyone regardless of geographical location worldwide. Electronic publications have now resoundingly replaced printed editions of journals. Collaborative research through social media platforms helps collect diverse data, enhancing the research's global generalisability. The current narrative review was planned to discuss the importance of social media in advancing surgical research and the use of different social media applications in the context of promoting and disseminating surgical research alongside its evolving ethical challenges.

Keywords: Surgical research, Social media, Collaborative research, Ethics, Virtual presentations.

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Introduction

With the rapid advancement in information technology (IT), social media (SM) has become widespread and an essential tool for networking, communication and content-sharing in all disciplines of life. The reach of SM in modern society is extensive, with an estimated 2.46 billion users across all platforms reported in 2017.¹ It is estimated that the average person spends nearly 2 hours per day using SM in any form. The use of SM in healthcare also continues to expand. It is used as an essential resource for disseminating knowledge related to different ailments and their most updated available treatment options.

The field of surgery and surgical research is no different. In surgery, SM rapidly presents new avenues and has

revolutionised every aspect of a surgeon's personal and professional life. The reported benefits include facilitating patient education, sharing information on new guidelines or published research, and increasing collaboration among the stakeholders, including patients, clinicians, trainees and educational institutions. However, some surgeons consider SM a gimmick designed to attract media attention even if alongside increasing the dissemination of research and knowledge.² Through generating online content, surgeons can increase the perception of their expertise in an online community, while patients use SM to find surgeons and to communicate about procedures and outcomes. During the ongoing coronavirus disease-2019 (COVID-19) pandemic, SM provided a means for rapid, international collaborative dissemination of data, management protocols and epidemiological findings.³

SM is an effective avenue for health professions and social sciences.⁴ In this digital era, the surgical field has grown into a vast society where new ideas are shared and assimilated rapidly through a tap on a screen across multiple SM applications. SM offers an abundance to the present and future of surgical research due to its easy accessibility, low cost and global outreach. SM has been leveraged to share manuscripts and engage in collaborative academic discussions, allowing greater visibility and reach of surgical research findings⁵. Various SM platforms focus on establishing networks and promoting communications that will enable rapid dissemination of knowledge and actual results of the latest surgical research across the globe. Enrolling volunteers, engaging students and surgical trainees, and connecting with experienced surgeon researchers are now relatively straightforward. Moreover, SM applications have helped conduct live scientific sessions and conferences that allow remote but digitally connected surgeons easy access to the latest surgical researches. A consensus paper in 2020 recommended the use of SM by surgical trainees to promote their skills and interests in surgical research.³

The mass dissemination and discussion of research on SM are also supported by many reputable journals, some of which also calculate an alternative metric, or altmetric, that takes into account SM engagement of

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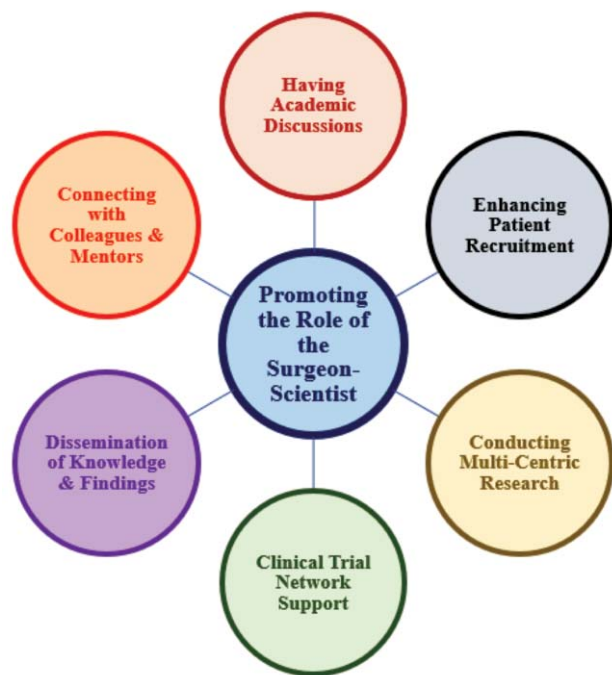


Figure: Ways in which social media facilitates the surgeon in conducting surgical research.

publications.^{2,6} Some journals even offer to provide post-publication SM dissemination of research via their SM platforms.⁷ In short, SM is now facilitating every possible aspect of a surgeon's research aspirations (Figure).

Commonly used SM apps in surgical research

Various SM applications have enabled surgeons to disseminate their scientific work through different collaborative platforms for surgical research, connecting surgeons through their shared interests in surgical research (Table). Each of these SM applications has a role in advancing surgical research.

Twitter: With more than 192 million daily users worldwide, and its brief content, Twitter is now serving as a beautiful microblog platform for conducting and

promoting surgical research. Surgeons have turned to Twitter to disseminate valuable information on surgical diseases and raise new surgical research questions. Academic and research institutions responsible for surgical training and research run their own Twitter accounts to give the latest updates related to surgical research. Medical journals share recent articles on Twitter, promoting research in a fast and effective way. The popularity of Twitter for disseminating surgical research has overgrown over the past few years. The development is evidenced by conference-specific hashtags facilitating international discussion, journal-specific journal clubs enabling post-publication peer review, and sharing results of novel surgical techniques via live surgical coverage. Twitter hashtags at medical conferences have revolutionised how healthcare professionals interact, advance their education, and spread their novel research ideas. Studies have shown that Twitter improved medical conferences' online participation from year to year by documenting increasing numbers of tweets, users and impressions.^{8,9} After promoting a hashtag at the conference, one study found that the organisational profile showed a 20% increase in followers over the following week.¹⁰ Various research academies and institutions that offer a wide variety of surgical research courses have official Twitter accounts that include participants nationally and globally. Novel strategies to increase attention to postings of journal content have also been employed, such as using a visual abstract, which is a concise graphic summary of the main findings of an article. Data suggests that this does drive traffic to a journal's website by up to threefold.^{11,12}

Facebook: Facebook is the oldest SM platform of the modern digital era and enables a diverse range of people to interact. Closed SM groups over Facebook offer unique opportunities to surgical researchers for conducting and promoting their work. It provides them with a method for rapid communication to advertise themselves and their novel research, and plays a substantial role in their professional development and advocacy. Surgeons and scientists use Facebook to disseminate and exchange information, education, research recruitment and community consultation for clinical trials. Facebook is widely used to increase the distribution of an article's message, and to potentially increase the dissemination of the article itself. Conferences on surgical innovations and research hold live sessions on Facebook, enhancing their accessibility to the target audience.⁶ Closed groups on Facebook develop collaboration among the researchers by asking questions, recruiting data and enrolling other researchers with common interests.

Table: Social media platforms used in surgical research and their mode of engagement.

Name	Logo	Engagement Method
Twitter		Hashtags, Retweets, Follows, Comments, Stories
Facebook		Likes, Comments, Follows, Joining Pages
Instagram		Reactions, Comments, Stories
LinkedIn		Connections
ResearchGate		Followers, Project Creation
Sermo		Provide Insights, Engage in Discussions

LinkedIn: LinkedIn is a platform that is mainly used for professional networking. LinkedIn allows members to create profiles and connect in an online social network which may represent real-world professional relationships. Surgical associations have LinkedIn accounts that help them to promote surgical innovation and research. Conference proceedings and visual abstracts are notified to followers and give easy access to the latest research in surgery.⁶ Members can get connected with well-accomplished surgical researchers and scientists.

ResearchGate: It is an European commercial social networking site for scientists and researchers to share papers, ask and answer questions, and find collaborators. ResearchGate members can upload research output, including articles, data, chapters, standalone results, research proposals, methods, presentations, etc. Account-holders can follow other researchers and also invite their co-authors to this SM platform. ResearchGate also calculates a Research Interest (RI) score for users and provides citation metrics. This platform is getting very popular among surgical researchers to aid networking with experts.⁶

Sermo: With over 800,000 users, Sermo is the world's most oversized virtual lounge for doctors. It has revolutionised real-world medicine by connecting doctors online to share wisdom and insights with their peers locally and globally.⁶ On Sermo, users can share their points of view, unite and be heard. This virtual platform is now helping many surgeons design research questions, seek expert opinions, and conduct quality research.

Collaborative surgical research through social media

SM has made it easier than ever before to conduct multi-centre surgical research, as it offers the opportunity to collectively accumulate surgical data from multiple centres with relative ease.⁵ SM has been used as a platform for patient recruitment for surgical trials¹ and several major global cohort studies. The GlobalSurg, the Student Audit and Registry in Surgery (STARSurgUK), the COVIDSurg and the COVIDSurg Cancer collaboratives are examples of multi-centre, collaborative, surgical initiatives.^{7,13} Moreover, SM also allows instantaneous widespread virtual access to sample populations geographically or otherwise inaccessible. In Pakistan, a survey of women surgeons disseminated via SM provided a large, representative sample otherwise unachievable due to the lack of any formal central connecting platform for surgeons in the country.¹⁴ Lastly, SM also promotes innovative research collaborations in surgery, which are

fostered due to the increased cross-disciplinary online interactions between surgeons and technology personnel, such as engineers, biomedical researchers and data scientists.⁷

Other applications of SM in surgical research include real-time conference posts and updates, multidisciplinary journal clubs, and surgical research skill-building opportunities.¹³ SM also serves as a platform for reputable surgical organisations, like the Association for Academic Surgery, to connect and communicate with surgeons globally regarding announcements, career opportunities, research and other awards, and scientific advancements.⁷ Moreover, SM platforms also provide surgeons unique access to professional and research mentorship,¹⁵ crucial for women surgeons who otherwise lack the exposure and opportunities to interact and collaborate with same-gender role models.¹⁶

Ethical challenges in conducting surgical research through SM

While SM plays a significant role in facilitating, attracting and glamourising research and researchers, professionalism and integrity may be compromised, often unintentionally.¹⁷ There are several potential risks as well as regulatory and ethical concerns associated with the use of SM that surgeons, trainees, and health institutions need to be aware of, as information may be permanently shared with millions.¹⁸ The researchers must be mindful of the complex ethical dilemmas associated with SM research, like subject recruitment, consent and autonomy, confidentiality, and risk to the researcher.

Subject recruitment: SM platforms offer unique and cost-effective opportunities for recruitment and intervention in the context of surgical research, particularly for studying health topics that are highly stigmatised, while connecting with populations that are hard to reach.¹⁹ However, when compared to the standard recruitment methods, some studies have identified issues, like low recruitment accrual due to a possible mismatch between the target group and the SM platform used, or an overall presentation of the call-out/advertisement for the recruitment; and unrepresentative samples, especially when incentives are offered or when non-specific SM platforms are used.

Consent and autonomy: In the case of SM or internet research, the question of when and how specific, informed consent should be obtained becomes challenging because the large volume of SM data makes it difficult to obtain informed consent from all users, as data cannot be easily tied to an identifiable individual; when some

organisation has provided a list of potential participants, the members may not have been informed or taken consent from; though information may be posted on individuals' public profile, it does not mean that they have consented to this data to be used for research;²⁰ and consent/exemptions for public datasets cannot be substituted as blanket permission for all SM research.

Data handling: Anonymity, confidentiality, and privacy: Owing to the public nature and varied use of SM for research, the emerging ethical issues revolving around privacy are complex, and the principles of anonymity and confidentiality are much more challenging to uphold. This is particularly true when individuals can be identified/traced directly through their Internet Protocol (IP) address or the internet links related to the website included in the research or through data retrieved/collected from the SM platforms, such as Twitter.^{21,22}

In addition, ethical issues surrounding data and image storage or destruction remain. Visual data, such as photographs posted on Facebook or Instagram, may pose a substantial risk to research participants' privacy and may even be subjected to potential manipulation. Even publicly available data may be considered private and sensitive by the user and requires protection to avoid hacking, identity theft, and data ownership.

Most platforms allow users to have 'pseudonymous' identities. They can engage in practices intended to facilitate non-identifiable content, but this in itself presents a unique ethical challenge to the principle of anonymisation.²³

There is yet another perspective to participant and data confidentiality. Rarely, though, the subjects of clinical trials may breach the confidentiality for want of recognition for participating and/or contributing to the research.²⁴

Risk to the researcher: SM is also being used to create one's professional presence by maintaining work relationships. But in the absence of appropriate disclaimers, a surgeons' posts might be viewed as medical advice, leading to potentially litigious consequences. Surgeons may also begin online communication with patients, inadvertently beginning doctor-patient relationships outside the usual clinical encounter, which may have legal implications.

Moreover, unintentionally posting unprofessional content on SM where the personal and professional identities are not separated may violate professional conduct. This allows the public to make judgments about health professionals and renders them more susceptible

to what one may call SM harassment in the form of hate speeches or threats.²⁵

Possible counter measures for avoiding ethical challenges

In 2010, the American Medical Association (AMA) released official guidelines for physicians' ethical use of SM.²⁶ These guidelines emphasise the need to maintain patient confidentiality, to be aware of privacy settings, to maintain appropriate patient-physician boundaries, to provide accurate and truthful information, and to act with collegiality.

Often it becomes difficult to differentiate between public and private cyberspace and the data available online on these spaces. If anyone can access the data without website registration or membership, it can be considered the internet's public domain. In contrast, password-protected data or websites requiring registration should be considered a private domain.

It is evident from literature that ethical SM research means differently to different disciplines and researchers, depending on their positionality and research method. The existing ethics review committees (ERCs) may be struggling to deal with the emerging technologies, and their implications and should not be solely relied upon as the moral compass. The researchers should report on the ethical dilemmas in their practice to guide the others, including the ERCs. There is a need for an ongoing process in which the researcher, the participants, and the ERCs work together to identify potential problems to the ever-evolving SM technology and use and find contextually relevant solutions.²⁷

Conclusion

In recent years, SM has become as a precious platform in advancing surgical research. It has opened new avenues for surgical researchers to expand their research and get digitally connected with their peers and experts across the globe. Collaboration among researchers is now increasing through SM. However, some ethical challenges unique to the SM must be considered for its safe and effective use.

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