



Social Media and Apps in Urology

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Abstract

Purpose of Review In this study, we aimed to review the common social media (SoMe) apps used and how they have impacted the practice and exchange of information, as well as the challenges of using SoMe in urology.

Recent Findings SoMe has become increasingly popular in the urology community. Lay users often turn to SoMe to learn about urological health and share their own experiences, while medical professionals may use it for career development, networking, education, and research purposes.

Summary It is important to recognize the power of SoMe and to use it responsibly and ethically, particularly given the potential risks of encountering low-quality or misleading information.

Keywords Urology · Social media (SoMe) · Mobile apps · Twitter · YouTube · Facebook · Instagram · TikTok · Reddit

Abbreviations

SoMe	Social media
AUA	American Urologic Association
EAU	European Association of Urology
NCCN	National Comprehensive Cancer Network

Introduction

In recent times, the rise of digital media, including the internet, mobile apps, and social media (SoMe), has greatly influenced how information is communicated and shared. SoMe platforms such as Twitter, YouTube, Facebook, and Instagram have become ubiquitous in our daily routines. In the healthcare industry, SoMe has transformed the way we interact with each other. It allows for the rapid dissemination of breaking news and research, promotes discussions among professionals and the general public, and enhances medical education and patient engagement [1–3]. The significance of SoMe as an outreach and educational tool was particularly evident during the COVID-19 pandemic [4–6].

As a specialty that actively embraces new technology, urology has seen the rapid growth of SoMe [7, 8]. According to a survey conducted in 2017, 74% of the 1731 participants had a SoMe account, with Facebook and YouTube being the most popular platforms [9•]. At the 2018 AUA conference, 18,863 tweets from 3887 contributors were generated using the hashtag #AUA18, resulting in 73,878 million impressions, a significant increase compared to 2013 [9•]. However, Twitter only represents one of the various apps that are highly used in the field of urology. In this study, we aimed to review the common SoMe apps used and how they have impacted the practice and exchange of information, as well as the challenges of using SoMe in urology.

Twitter

Twitter, a microblogging SoMe platform, offers the ability to share a short amount of information in real-time, and it is often used to share breaking news or to engage in public conversations. According to Pew Research Center, nearly one in five adults in the U.S. use Twitter [10]. It has also become a popular platform among healthcare professionals, including urologists, to connect with and engage with one another, offering opportunities for news, knowledge sharing, research, and networking [11]. In 2020, a study found that Twitter usage was 49.3% and 34.1% among 156 academic programs (143 in the US, 13 in Canada) and 2214 academic faculty, respectively [12].

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Twitter has had a variety of impacts on medical professionals in urology. It has made it easier for attendees of urological conferences to share knowledge, participate in discussions and ask questions, especially during the COVID-19 pandemic. With its public nature, this also allows non-attendees to learn and engage with tweeted content from conferences. Wilkinson et al. evaluated Twitter activity at eight major urology meetings and found that among all meetings, 12,363 tweets were sent, generating over 14 million impressions [13]. In particular, for the European Association of Urology (EAU) conference, the number of tweets increased from 347 to almost 6000 over three years. Chung et al. evaluated if the use of Twitter was more active among urology conferences compared to other specialties. On a daily basis, 3-fold more tweets and 1.6-fold more impressions were noted in urological surgical meetings than non-urological ones [14].

Besides conferences, Twitter has also been widely used for other academic purposes. Leading urological journals have adopted it to increase the exposure of research. Individual researchers can also use SoMe to highlight their own research and engage in scientific discussions with readers. Hayon et al. found that compared to articles which were not tweeted by their authors, articles tweeted achieved 12.3 (2.0-fold) and 15.5 (1.8-fold) more mean citations for Scopus and Google Scholar, respectively [15].

In terms of education, Twitter plays an important role in the residency application process. Not only do programs share and post information for the public, but applicants also find it helpful to use Twitter for networking, information acquisition, and connecting with mentors and peers. In 2021, 79% of urology applicants reported using a Twitter account during the application season [16]. Friedman et al. evaluated the relationship between Twitter engagement and urology residency match for the 2021 application season and found that matched applicants were more likely to have a Twitter account (59% matched vs. 28% unmatched) [17•]. Characters such as more followers, bios mentioning urology, home urology residency programs, and no international flags and/or references were associated with going matched.

It is worth noting that Twitter is an open platform for urologists to quickly and efficiently react and express opinions on specific health policies and guidelines. In 2019, NCCN made a change where active surveillance was no longer the preferred management strategy for low-risk prostate cancer. However, for very low-risk prostate cancer, active surveillance remained the preferred strategy. This change sparked a dramatic response among urologists on Twitter, who actively engaged in the heated debate. Their voices were heard, and eventually NCCN reversed the guideline after considering their opinion [18].

YouTube

Unlike Twitter, which primarily focuses on sharing text-based content, YouTube is a platform that primarily allows users to share video-based content for educational or entertainment purposes. There are at least 800 million videos on YouTube and 122 million daily active users worldwide [19]. Urologists and other healthcare professionals use YouTube to share educational videos, lectures, patient education materials, and videos of surgical procedures and other clinical demonstrations. Mota et al. conducted a survey and found that 98.6% of respondents had used videos, particularly from YouTube, to prepare for surgery [20]. A more recent study by Eccles et al. found that, in a survey of 108 urology residents from 145 residency programs, YouTube was ranked as the primary reference for preparing for surgical procedures [21].

Many of the videos shared on YouTube are intended for lay audiences such as patients and cover a range of urological conditions, including benign conditions like urinary stone disease and sexual dysfunction, and malignancies such as prostate cancer. However, there are concerns about the quality of the information shared in these videos and the potential for misinformation. Betschart et al. systematically reviewed videos on YouTube discussing treatment options for lower urinary tract symptoms/benign prostatic hyperplasia. Out of 159 relevant videos, only 13.2% contained no misinformation, and 16.4% were free of commercial bias. The overall quality of the videos was low (median DISCERN score was 2) [22]. Another study investigating the quality of YouTube videos on erectile dysfunction found that 28% had misinformation and the median DISCERN score was only 2 [23]. Loeb et al. reviewed 150 YouTube videos on prostate cancer screening and treatment in 2018 and found that 77% contained misinformative content [24]. It is important to be aware of this issue as exposure to incorrect information can potentially lead to delayed diagnosis, treatment, or incorrect/over-treatment. The urology and medical communities should pay attention to the quality of videos and work to address misinformation on the platform [25]. As of October 2022, YouTube has introduced a certification program for health-related channels and creators. The program aims to ensure that content adheres to guidelines established by the Council of Medical Specialty Societies, the National Academy of Medicine, and the World Health Organization. The objective of this initiative is to promote the dissemination of accurate, evidence-based information from verified and qualified health professionals and creators.

Facebook

According to an updated survey among members of AUA in 2015, Facebook was the most popular SoMe platform among respondents (89%) [26]. Urologists can use it as a platform for communication and sharing information, including

posting articles, videos, and other content about urological health and wellness, connecting with their patients, and providing them with additional resources and support. However, urologists use Facebook more for personal reasons than Twitter and YouTube. A study by Koo et al. investigated the content shared on Facebook by urology residency graduates in 2015. Among 201 publicly identifiable graduates, 40% included unprofessional or potentially objectionable content [27].

As a platform with a large number of users, including many young and college students, Facebook serves as a source of sexual knowledge and promotes sexual health. Jones et al. evaluated how a Facebook site containing knowledge about chlamydia infection could improve sexual behavior among younger people aged 15–24 [28]. Results showed a 23% increase in condom use and a 54% reduction in positive chlamydia cases among 15 to 17-year-old, suggesting that SoMe platforms such as Facebook could be a helpful source of information dissemination and promote positive sexual behavior among this population.

Other physicians have tried to use Facebook to increase live kidney donation. One study reviewed 91 qualified pages seeking live kidney donors, 32% of which reported testing of potential donors, and 10% reported receiving transplants. Facebook offers a free and open platform for people seeking specific help to disseminate information to their known friends and even strangers and has the potential to be effective for this purpose [29].

TikTok

TikTok is a SoMe platform that allows users to create and share short videos, often enhanced with music, filters and effects. As the fastest-growing video platform globally, it has been downloaded over 2 billion times by 2021 [30]. More and more consumers and patients are sharing their experiences and stories, and searching for information on medicine, including urology, via TikTok. Urologists have utilized TikTok to share information about urological conditions, surgical demonstrations, patient testimonials, and other medical content. Some urologists have used TikTok to share jokes and memes related to urology and their experiences and challenges as medical professionals.

It is important to note that information on TikTok should be evaluated for accuracy. O'Sullivan et al. studied the content of pediatric urology on TikTok and found that only 22.2% of the videos contained EAU guideline-supported information [31]. Xu et al. analyzed 55 videos with the hashtag #prostatecancer and found that the median DISCERN score was only 2, indicating low-quality of those videos, 98.2% of which accounted for 134,752 or 97.4% of total

views [32]. Even among the 17 videos with objective information, significant amount of misinformation was noted from 41% of them, such as promoting routine PSA screening at age 30 and promoting a “miracle cure” beverage. Other researchers have reported similar issues with men's health and UTI content on TikTok [33, 34]. It is important to note that SoMe platforms such as TikTok may be used for personal purposes and not necessarily for professional or academic purposes within the field.

Instagram

Instagram is a SoMe platform that enables users to share photos and videos and interact with others through likes, comments, and hashtags. They can also create and use hashtags to categorize their content and make it more discoverable to others. The platform is particularly popular among young people and has been used to share a wide range of content, including fashion, travel, food, and more. In addition to personal accounts, Instagram is also used by businesses and organizations to promote their products and services and connect with their customers and followers. In the field of urology, both programs and urologists use Instagram to share information and interact with a more laidback vibe. According to a survey conducted in 2022, 43.9% (61 out of 139) of urology residency programs had an Instagram account [35]. In a separate study of urology applicants, 71% of participants (144 responders) had a preexisting Instagram account, while only 3% created a new account during the 2021 AUA match cycle [16].

Compared to Twitter, YouTube, and Facebook, the research on the use of Instagram is less robust, and the few studies that have been conducted have focused more on describing the current status and analyzing content quality [33, 36, 37]. In a study conducted by Herbert and colleagues, the quality of posts related to pelvic organ prolapse on Instagram was evaluated. The results of the study indicated that out of 105 posts analyzed, 76% were of moderate to poor quality. Additionally, 25 of the posts were found to have potential commercial bias. The study also noted that no comprehensive information on treatment options was identified, with the exception of pelvic muscle training. This lack of information could potentially lead to misleading information and influence the decision-making of users [38].

Reddit

Reddit is a SoMe platform that consists of forums, or “subreddits,” where users can post content and engage in discussions on various topics. The platform was founded in 2005 and has

Table 1 Features of common social media apps on the current market














Apps	Owner	Year started	Statistics	Popularity in urology	Key functions
	Twitter, Inc United States	2006	368 Million monthly active users as of 2022	<ul style="list-style-type: none"> - 77% of urology residency program directors reported using Twitter in 2021 [45] - Half of AUA members use Twitter [9•] - An estimated 113 U.S. academic urology programs have a Twitter account in 2020 [46] - 79% of urology applicants reported using a Twitter account during the 2021 application season [16] 	<ul style="list-style-type: none"> - Personal career promotion and development - Networking - Conference information - Knowledge acquisition - Education - Socializing
	Google United States	2005	2.24 Billion users worldwide as of 2021	<ul style="list-style-type: none"> - A survey of 1731 AUA members, 53% had a YouTube account in 2017 [9•] - 87% of 108 U.S. urology residents reported using videos for surgical preparation, 93% of which used YouTube [21] - A survey of 1731 AUA members, 88% used Facebook in 2017 [9•] 	<ul style="list-style-type: none"> - Videos for patient education - Demonstration for certain condition - Professional education
	Meta Platforms United States	2004	2.96 Billion monthly active users as of the third quarter of 2022	<ul style="list-style-type: none"> - A survey of 1731 AUA members, 42% had an Instagram account in 2017 [9•] - A survey in 2022, 43.9% (61 out of 139) of urology residency programs had an Instagram account [35] - 71% of participants (144 responders) had a preexisting Instagram account in the 2021 season [16] 	<ul style="list-style-type: none"> - Networking - Socializing - Sharing information
	Meta Platforms United States	2010	1.21 Billion monthly active users as of 2021	<ul style="list-style-type: none"> - A survey of 1731 AUA members, 66% had a LinkedIn account in 2017 [9•] 	<ul style="list-style-type: none"> - Socializing - Posting photos and videos (personal or professional)
	ByteDance China	2016	755 Million as of 2022	N/A	<ul style="list-style-type: none"> - Career development - Socializing - Patient education
	Advance Publications United States	2005	1.7 Billion visits as of May 2022	N/A	<ul style="list-style-type: none"> - Patient education - Information acquisition
	Microsoft United States	2003	774 Million as of 2021	<ul style="list-style-type: none"> - A survey of 1731 AUA members, 66% had a LinkedIn account in 2017 [9•] 	<ul style="list-style-type: none"> - Networking - Career development - Sharing information on job market
	ResearchGate GmbH Germany	2008	20 Million as of 2022	N/A	<ul style="list-style-type: none"> - Sharing research and publication - Career development - Knowledge acquisition
	Doximity, Inc United States	2010	2 Million US healthcare professionals	N/A	<ul style="list-style-type: none"> - Career development - Information acquisition - Education - Networking

Table 1 (continued)

Apps	Owner	Year started	Statistics	Popularity in urology	Key functions
	Pinterest, Inc United States	2010	445 Million monthly users as of the third quarter of 2022	<ul style="list-style-type: none"> - A survey of 1731 AUA members, 22% had a Pinterest account in 2017 [9•] 	<ul style="list-style-type: none"> - Career promotion - Patient education
	Snap, Inc United States	2011	363 Million daily users worldwide as of the third quarter of 2022	<ul style="list-style-type: none"> - A survey of 1731 AUA members, 17% had a Snapchat account in 2017 [9•] 	<ul style="list-style-type: none"> - Networking - Socializing
	Tencent China	2011	1.3 Billion monthly active users as of the September 2022	<ul style="list-style-type: none"> - A survey in 2016 in China showed 92.8% of respondents used WeChat [47] 	<ul style="list-style-type: none"> - Conference information - Career development/promotion - Sharing information/knowledge in urology - Patients group/community - Networking - Socializing
	Sina Corporation China	2009	584 Million of monthly active users as of September 2022	<ul style="list-style-type: none"> - A survey in 2016 in China showed 63.0% of respondents had an account of Sina Weibo [47] 	<ul style="list-style-type: none"> - Patient education - Sharing information/knowledge - Career development - Patient networking - Socializing

become one of the most popular and influential SoMe platforms globally. On Reddit, users can create posts, which can be text-based or include links to other content, and other users can upvote or downvote these posts based on their value or relevance. They can also comment on posts and participate in discussions with other users. Reddit is divided into thousands of subreddit communities, each focused on a specific topic or interest. Subreddits can be created by anyone and cover a wide range of topics, including news, entertainment, politics, science, sports, and, of course, urology. Reddit is known for its strong sense of community and its ability to facilitate meaningful discussions and information exchange.

There is increasing interest among researchers in the field of urology to utilize Reddit as a tool to gain insight into patient experiences. The platform has been gaining attention as a valuable resource for understanding the perspectives and concerns of individuals affected by urologic conditions [39–41]. Jiang et al. evaluated patient concerns and preferences for the management of urinary stone disease during the COVID-19 pandemic by analyzing 418 kidney stone-related posts (179 pre- and 239 during COVID-19) on Reddit. Patients expressed more negative and anxious tones during COVID-19 and tended to shift away from in-person visits and procedures [42]. These discussions on Reddit provided contemporaneous insight into patients' experiences for professionals. Other studies have examined whether information shared on Reddit is accurate or misleading. Sellke et al. reviewed 2634 comments from two subreddits regarding treatments for erectile dysfunction. Among the 45 treatments discussed, only 24.4% were supported by the current AUA guidelines, which was alarming since the majority of the recommendations had no strong clinical evidence [43]. In another study conducted by Belcher and colleagues, the experience of women with low libido on Reddit was analyzed by reviewing 85 threads and approximately 2900 comments. The study found that the platform not only serves as a resource and support group for individuals experiencing female sexual dysfunction, but also has the potential to improve provider awareness and education for a patient-centered approach in managing this condition [44].

Other Apps and Platforms

Other Apps and platforms that are commonly used in the field of urology include LinkedIn, Doximity, ResearchGate, and Pinterest. These platforms are used for various purposes and are presented in Table 1.

Future Directions

As we continue to navigate the constantly evolving digital landscape, it's important to recognize the influence of SoMe and learn how to use it responsibly. While it's difficult to predict the exact future of SoMe in urology, it's likely that it will continue to play a significant role in the field as it allows healthcare professionals to easily share information, promote career development, and connect with patients and colleagues [48].

One pressing issue that needs to be addressed is the quality and accuracy of content shared on SoMe, as misinformation and low-quality content are common and can be harmful [49]. To address it, it's important to understand how SoMe misinformation impacts decision-making and work out the best ways to mitigate it [50, 51]. On both personal level and institute/organization level, efforts need to be made to educate the general public and urological patients about the risks of encountering low-quality information on SoMe, disseminate reliable, high-quality information, and establish regulations and even laws for a healthy SoMe environment [52, 53, 54].

Regarding research, the majority of studies have focused on the impact of SoMe on medical professionals, but very few have truly examined the perceptions and impact from lay consumers or patients' perspectives. In the future, the urology community should consider developing more research on improving patients' acceptance and experience when using SoMe to gain knowledge and interact with medical professionals [55, 56].

Conclusions

SoMe has become increasingly popular in the urology community, with both lay users and medical professionals using it for a variety of purposes. Lay users often turn to SoMe to learn about urological health and share their own experiences, while medical professionals may use it for career development, networking, education, and research purposes. It is important to recognize the power of SoMe and to use it responsibly and ethically, particularly given the potential risks of encountering low-quality or misleading information.

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References

Papers of particular interest, published recently, have been highlighted as: • Of importance

- Chen J, Wang Y. Social media use for health purposes: systematic review. *J Med Internet Res*. 2021;23(5): e17917.
- Braun LA, Zomorodbakhsch B, Keinki C, Huebner J. Information needs, communication and usage of social media by cancer patients and their relatives. *J Cancer Res Clin Oncol*. 2019;145(7):1865–75.
- Jha A, Lin L, Savoia E. The use of social media by state health departments in the US: analyzing health communication through Facebook. *J Community Health*. 2016;41(1):174–9.
- Zhong Y, Liu W, Lee TY, Zhao H, Ji J. Risk perception, knowledge, information sources and emotional states among COVID-19 patients in Wuhan, China. *Nurs Outlook*. 2021;69(1):13–21.
- Gunasekeran DV, Chew A, Chandrasekar EK, Rajendram P, Kandarpa V, Rajendram M, Chia A, Smith H, Leong CK. The impact and applications of social media platforms for public health responses before and during the COVID-19 pandemic: systematic literature review. *J Med Internet Res*. 2022;24(4): e33680.
- Aggarwal NR, Alasnag M, Mamas MA. Social media in the era of COVID-19. *Open Heart*. 2020;7(2): e001352.
- Leveridge MJ. The emerging role of social media in urology. *Rev Urol*. 2014;16(3):110.
- Saade K, Shelton T, Ernst M. The use of social media for medical education within urology: a journey still in progress. *Curr Urol Rep*. 2021;22(12):1–6.
- Loeb S, Carrick T, Frey C, Titus T. Increasing social media use in urology: 2017 American Urological Association Survey. *Eur Urol Focus*. 2020;6(3):605–8. *This study is one of the very few survey studies that looked at the use of social media among a large and diverse group of urologists, which helps the whole urology community better understand the current status and future director for the use of social media.*
- Pew Research Center. 10 Facts about Americans and Twitter, Pew Research Center. 2022. <https://www.pewresearch.org/fact-tank/2022/05/05/10-facts-about-americans-and-twitter/>. Accessed 10 May 2022.
- Pershad Y, Hangge PT, Albadawi H, Oklu R. Social medicine: Twitter in healthcare. *J Clin Med*. 2018;7(6):121.
- Chandrasekar T, Goldberg H, Klaassen Z, Wallis CJ, Leong JY, Liem S, Teplitsky S, Noorani R, Loeb S. Twitter and academic urology in the United States and Canada: a comprehensive assessment of the Twitterverse in 2019. *BJU Int*. 2020;125(1):173–81.
- Wilkinson SE, Basto MY, Perovic G, Lawrentschuk N, Murphy DG. The social media revolution is changing the conference experience: analytics and trends from eight international meetings. *BJU Int*. 2015;115(5):839–46.
- Chung A, Woo H. Twitter in urology and other surgical specialties at global conferences. *ANZ J Surg*. 2016;86(4):224–7.

15. Hayon S, Tripathi H, Stormont IM, Dunne MM, Naslund MJ, Siddiqui MM. Twitter mentions and academic citations in the urologic literature. *Urology*. 2019;123:28–33.
16. Carpinito GP, Caldwell KM, Kenigsberg AP, Ganesan V, Khouri RK Jr, Kuprasertkul A, Hudak SJ, Lemack GE. Twitter and Instagram use in the urology residency application process. *Urology*. 2022;159:22–7.
17. Friedman BJ, Chen I, Asantey K, Loeb S, Kim SP, Malik RD, Karabon P, Wunderlich-Barillas T, Chandrasekar T. Twitter engagement of medical students applying to urology residency during COVID-19: a mixed methods study. *Urology* 2022. *This study evaluated the relationship between Twitter engagement and urology residency match for the 2021 application season. It may help future urology applicants when they decide if they should and how to better use social media to boost their application.*
18. Hart J. Unexpected NCCN update to active surveillance guideline prompts Twitter uproar among urologists. October 2021 <https://www.urologytimes.com/view/unexpected-nccn-update-to-active-surveillance-guideline-prompts-twitter-uproar-among-urologists>.
19. YouTube user statistics 2022. <https://www.globalmediainsight.com/blog/youtube-users-statistics/>.
20. Mota P, Carvalho N, Carvalho-Dias E, Costa MJ, Correia-Pinto J, Lima E. Video-based surgical learning: improving trainee education and preparation for surgery. *J Surg Educ*. 2018;75(3):828–35.
21. Eccles JM, Michalak NR, Raman JD, MacDonald SM. Surgical preparation by urology trainees in 2021: the interplay of video and print resources. *Urol Pract*. 2022;9(5):512–8.
22. Betschart P, Pratsinis M, Müllhaupt G, Rechner R, Herrmann TR, Gratzke C, Schmid HP, Zumstein V, Abt D. Information on surgical treatment of benign prostatic hyperplasia on YouTube is highly biased and misleading. *BJU Int*. 2020;125(4):595–601.
23. Fode M, Nolsøe AB, Jacobsen FM, Russo GI, Østergren PB, Jensen CF, Albersen M, Capogrosso P, Sønksen J. Quality of information in YouTube videos on erectile dysfunction. *Sex Med*. 2020;8(3):408–13.
24. Loeb S, Sengupta S, Butaney M, Macaluso JN Jr, Czarniecki SW, Robbins R, Braithwaite RS, Gao L, Byrne N, Walter D, Langford A. Dissemination of misinformative and biased information about prostate cancer on YouTube. *Eur Urol*. 2019;75(4):564–7.
25. Teoh JY, Cacciamani GE, Gomez RJ. Social media and misinformation in urology: what can be done? *BJU Int*. 2021;128(4):397.
26. Loeb S, Bayne CE, Frey C, Davies BJ, Averch TD, Woo HH, Stork B, Cooperberg MR, Griebing TL, Eggener SE, American Urological Association Social Media Work Group. Updated survey of social media use by members of the American Urological Association. *Urol Pract*. 2015;2(3):138–43.
27. Koo K, Ficko Z, Gormley EA. Unprofessional content on Facebook accounts of US urology residency graduates. *BJU Int*. 2017;119(6):955–60.
28. Jones K, Baldwin KA, Lewis PR. The potential influence of a social media intervention on risky sexual behavior and *Chlamydia* incidence. *J Community Health Nurs*. 2012;29(2):106–20.
29. Chang A, Anderson EE, Turner HT, Shoham D, Hou SH, Grams M. Identifying potential kidney donors using social networking web sites. *Clin Transplant*. 2013;27(3):E320–6.
30. Business of Apps. TikTok revenue and usage statistics. Business of Apps; 2021. <https://www.businessofapps.com/data/tik-tok-statistics>.
31. O'Sullivan NJ, Nason G, Manecksha RP, O'Kelly F. The unintentional spread of misinformation on 'TikTok'; a paediatric urological perspective. *J Pediatr Urol*. 2022;18(3):371–5.
32. Xu AJ, Taylor J, Gao T, Mihalcea R, Perez-Rosas V, Loeb S. TikTok and prostate cancer: misinformation and quality of information using validated questionnaires. *BJU Int*. 2021;128(4):435–7.
33. Dubin JM, Aguiar JA, Lin JS, Greenberg DR, Keeter MK, Fantus RJ, Pham MN, Hudnall MT, Bennett NE, Brannigan RE, Halpern JA. The broad reach and inaccuracy of men's health information on social media: analysis of TikTok and Instagram. *Int J Impot Res*. 2022. <https://doi.org/10.1038/s41443-022-00645-6>.
34. Tam J, Porter EK, Lee UJ. Examination of information and misinformation about urinary tract infections on TikTok and YouTube. *Urology*. 2022;168:35–40.
35. Leung SJ, Chiang BJ, Roseman JT, Klausner A. The utility of social media on urology residency Doximity rankings. *Cureus*. 2022. <https://doi.org/10.7759/cureus.29666>.
36. Xu AJ, Myrie A, Taylor JI, Matulewicz R, Gao T, Pérez-Rosas V, Mihalcea R, Loeb S. Instagram and prostate cancer: using validated instruments to assess the quality of information on social media. *Prostate Cancer Prostatic Dis*. 2021;25(4):1–3.
37. Çağlayan A, Gül M. # Penislargement on Instagram: a mixed-methods study. *Int J Impot Res*. 2022. <https://doi.org/10.1038/s41443-022-00646-5>.
38. Herbert AS, Pace L, Munir A, Malik RD. Instagram's pelvic organ prolapse content discusses limited treatment options leaving users susceptible to biased information. *J Consum Health Internet*. 2020;24(4):360–9.
39. Uwumiro F, Zaka A, Pace L, Hassan N, Cherian T, Malik R. Poster #m31 insights into sexual dysfunction among multiple sclerosis patients shared on Reddit forums. In: SUFU 2022 conference, February 2022.
40. Khan Z, Kenee P, Abouzaglo S, Foster J, McCoy J, Hassan S, Zimmermann P, Malik R. Poster #om13 assessing quality of information about uncomplicated recurrent urinary tract infections on Reddit. In: SUFU 2022 conference, February 2022.
41. Belcher R, Sim D, Meykler M, Owens-Walton J, Hassan N, Rubin R, Malik R. Poster #nm11 "o" no: a Reddit analysis of orgasmic dysfunction. In: SUFU 2022 conference, February 2022.
42. Jiang T, Osadchiv V, Weinberger JM, Zheng MH, Owen MH, Leonard SA, Mills JN, Kachroo N, Eleswarapu SV. Impact of the COVID-19 pandemic on patient preferences and decision making for symptomatic urolithiasis. *J Endourol*. 2021;35(8):1250–6.
43. Sellke N, Jesse E, Callegari M, Muncey W, Harris D, Edwins R, Pominville R, Ghayda RA, Loeb A, Thirumavalavan N. Is Reddit a reliable source for information on erectile dysfunction treatment? *Int J Impot Res*. 2022. <https://doi.org/10.1038/s41443-022-00586-0>.
44. Belcher R, Sim D, Meykler M, Owens-Walton J, Hassan N, Rubin R, Malik R. Female sexual dysfunction: a Reddit analysis of the lost libido. *J Sex Med*. 2022;19(8):S19-20.
45. Heard JR, Wyant WA, Loeb S, Marcovich R, Dubin JM. Perspectives of residency applicants and program directors on the role of social media in the 2021 urology residency match. *Urology*. 2022;164:68–73.
46. Manning E, Calaway A, Dubin JM, Loeb S, Sindhani M, Kutikov A, Ponsky L, Mishra K, Bukavina L. Growth of the Twitter presence of academic urology training programs and its catalysis by the COVID-19 pandemic. *Eur Urol*. 2021;80(2):261.
47. Long X, Qi L, Ou Z, Zu X, Cao Z, Zeng X, Li Y, Chen M, Wang Z, Wang L. Evolving use of social media among Chinese urologists: opportunity or challenge? *PLoS ONE*. 2017;12(7):e0181895.
48. Rivas JG, Socarrás MR, Blanco LT. Social Media in Urology: opportunities, applications, appropriate use and new horizons. *Cent Eur J Urol*. 2016;69(3):293.
49. Loeb S, Taylor J, Borin JF, Mihalcea R, Perez-Rosas V, Byrne N, Chiang AL, Langford A. Fake news: spread of misinformation about urological conditions on social media. *Eur Urol Focus*. 2020;6(3):437–9.
50. Trethewey SP. Strategies to combat medical misinformation on social media. *Postgrad Med J*. 2020;96(1131):4–6.

51. Loeb S, Malik R. Methodologies in social media research: where we are and where we still need to go? *JCO Oncol Pract.* 2022;18(8):533–5.
52. • Taylor J, Loeb S. Guideline of guidelines: social media in urology. *BJU Int.* 2020;125(3):379–82. *This study outlines some of the best practice principles from several professional guidelines for urologists and other medical professionals for the use of social media.*
53. • Borgmann H, Cooperberg M, Murphy D, Loeb S, N'Dow J, Ribal MJ, Woo H, Rouprêt M, Winterbottom A, Wijburg C, Wirth M. Online professionalism—2018 update of European Association of Urology (@ Uroweb) recommendations on the appropriate use of social media. *Eur Urol.* 2018;74(5):644–50. *This review study, serving as a “guideline”, can help establish an effective and professional use of social media.*
54. Social media best practices. <https://auanet.mediaroom.com/index.php?s=20294>.
55. McDonald L, Malcolm B, Ramagopalan S, Syrad H. Real-world data and the patient perspective: the PROMise of social media? *BMC Med.* 2019;17(1):1–5.
56. Khan MI, Rahman ZU, Saleh MA, Khan SU. Social media and social support: a framework for patient satisfaction in healthcare. *Informatics.* 2022;9(1):22.

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