



# Analysis of patient perceptions of Mohs surgery on social media platforms

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## Abstract

This study assessed social media content to improve understanding of patient experiences with Mohs surgery. An initial search of public Instagram posts and tweets tagged with “#mohssurgery” or “@mohssurgery” identified 1692 Instagram posts and 115 tweets, of which 1390 and 94 were eliminated, respectively, given that they did not directly include a patient’s own experience. The team analyzed the posts/tweets for patient gender, timing of post prior to or after their procedure, and classified themes related to patients’ experience with Mohs. Analysis showed that 91.4% of Instagram posts and 75.0% of tweets were published post-Mohs surgery, with the majority made by women. The most common theme on Twitter was updating followers on treatment progress (30.0%) and on Instagram, the most common theme was spreading awareness of skin cancer/encouraging others to protect their skin (18.9%). Other common themes included concern of appearance during recovery process, scars after treatment, and healing progress. Social media has the ability to provide a platform for patients to impart their personal experiences with Mohs surgery performed on skin cancer lesions.

**Keywords** Dermatologic surgery · Mohs · Social media · Patient education · Skin cancer · Internet

## Introduction

In recent decades, social media has become an increasingly influential tool in the dissemination of information amongst the general public. Prior studies have demonstrated the efficacy of online social networks in influencing health behaviors, decisions, and perceptions [1, 12, 14]. As a result of these rapid and accessible avenues of discussion amongst individuals with Internet access, social media platforms have flourished into an ever-expanding resource for health services. A study in 2015 examined patients’ use of Twitter in gaining insight into the experience of magnetic resonance imaging (MRI) and another studied how the use of Twitter relates to patient perceptions of mammography [3, 11]. Research analysis of social media data involves many challenges, such as managing the large quantity of data and

accounting for the length of specific posts. There is a paucity of standardized metrics and methodologies regarding the analysis of social media data.

A prior report evaluating methodology for health services research using Twitter and Instagram forums suggests that subjective coding outperforms other strategies used for automatic classification [5]. While social media can be a valuable resource in allowing patients to engage with one another, it can also have a role in circulating misinformation regarding medical conditions, procedure, and/or public health concerns, as evidenced by discussions on the MMR vaccine online [8, 9]. Recognizing this ability of social media users to spread health-related materials and opinions to wide audiences, it is important that healthcare professionals understand current online content as it pertains to their patients.

Social media is utilized by major dermatology organizations such as the American Academy of Dermatology (AAD) as a platform for online discussion of relevant topics in dermatology and for sharing/dispersion live posts at their annual conferences. An important benefit of such accounts is that they allow for the dispersion of physician-approved information to the general public which is more accurate than outside sources and delivered in an organized fashion.

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Social media communications related to healthcare in general are fairly commonplace, yet assessment of social media posts and pages related to surgical procedures is still in its early stages. Studies found that social media allows patients to voice their opinions and experiences related to topics such as mammography and mental health disorders [1, 13]. Similarly, we hypothesized that patients undergoing Mohs surgery may use social media as a tool to share their experiences to ultimately educate others. The aim of this study is to assess this hypothesis via the analysis of major themes associated with the patient experience of those undergoing Mohs surgery as conveyed on Instagram and Twitter.

## Materials and methods

Hashtags on Instagram and Twitter were used to locate relevant data in the initial sampling process. Facebook was considered as a potential resource for identifying themes of posts; however, it was not chosen due to greater privacy settings compared to both Instagram and Twitter.

For Instagram, we searched the platform for posts written in English using the hashtag “#mohssurgery” since this study’s primary focus is on analyzing patient experiences with Mohs surgery. The first search for Instagram posts tagged with “#mohssurgery” from June 1, 2017, to June 1, 2018, yielded a total of 1692 posts. Of these, 1390 posts were eliminated by a single investigator as they did not pertain directly to the patient’s personal experience. These included posts that were involving Mohs surgery in general but were not from an individual’s Mohs surgery experience, such as posts describing the experience of others undergoing Mohs surgery, posts shared by healthcare organizations, or posts by private practitioners showing the results of completed Mohs surgeries. This elimination process narrowed the final pool down to 302 posts.

Next, the 302 posts were reviewed by a single investigator, and a list of general themes was created based on the content of posts. After this, posts were sorted according to the patient’s gender and if the post occurred before or after the Mohs procedure. If gender was unclear in the Mohs surgery post, the Instagram user’s publicly available account was explored to determine the gender. Instagram posts were sorted based on their relation to 1 of the 15 identified themes. One theme was assigned per post, and when

multiple themes were addressed in a single post, the theme that captured the main objective of the post was chosen. The frequency of all posts in terms of overall theme, gender, and pre-/post-surgery was then evaluated.

Similarly, the preliminary search for twitter posts, also referred to as “tweets”, using the hashtag “#mohssurgery” yielded 115 hits in total. There were no date limitations used for our Twitter search due to the relatively smaller number of tweets available in comparison to Instagram posts on this topic. Of these, 95 tweets were removed from the data pool using the same elimination process detailed previously for Instagram posts, resulting in a final group of 20 tweets from January 27th, 2011 to June 12th, 2018. Tweets were sorted based on gender and timing of the patient’s procedure. Subsequently, tweets were assigned a main theme, which were identified previously in the Instagram analysis; the frequencies of all themes were evaluated.

## Results

Of the 302 Instagram posts and 20 tweets, 91.4% and 75.0%, respectively, occurred post-treatment. Notably, Instagram posts and tweets regarding the patient’s own experience in undergoing Mohs surgery were produced by women 93.0% and 65.0% of the time, respectively (Table 1).

The frequencies of major themes relating to the experience of undergoing Mohs surgery were assessed (Table 2). The most common theme appearing in the group of Instagram posts was spreading awareness of skin cancer and encouraging others to protect their skin (18.9%), whereas the most common theme in Twitter posts involved updating followers on treatment progress (30.0%). Other frequently coded themes on Instagram included concern of wound appearance while recovering from treatment (11.6%), scarring after treatment (10.3%), and satisfaction with the healing process (9.3%). A range of other themes was present in the remaining posts (Table 2).

## Discussion

This study identified key themes expressed by patients on Instagram and Twitter in relation to their experiences with undergoing Mohs surgery for the removal of neoplastic skin

**Table 1** Characteristics of 302 included Instagram posts and 20 included tweets

Characteristic	Frequency on Instagram	Frequency on Twitter
Pre-treatment social media post	8.6% (26)	25.0% (5)
Post-treatment social media post	91.4% (276)	75.0% (15)
Females	93.0% (281)	65.0% (13)
Males	7.0% (21)	35.0% (7)

**Table 2** Frequency of themes within patient Instagram posts and tweets regarding the experience of undergoing Mohs surgery

Themes	Frequency in original Instagram post	Frequency in patient tweets
Spreading awareness of skin cancer/encouraging others to protect their skin	18.9% (57)	10.0% (2)
Concern of appearance while recovering from treatment	11.6% (35)	10.0% (2)
Updating followers on treatment progress	11.6% (35)	30.0% (6)
Concern of appearance of scars after treatment	10.3% (31)	N/A
Satisfaction with healing process	9.3% (28)	5.0% (1)
How Mohs surgery has affected patient's daily living	7.0% (21)	10.0% (2)
Thankfulness for beating cancer	6.6% (20)	N/A
How experience has affected patient's mental health	5.6% (17)	N/A
Regret of past skin safety habits	4.3% (13)	N/A
Reflection on how experience made patient stronger	3.6% (11)	N/A
Recounting presentation of symptoms	3.3% (10)	15.0% (3)
Fear of Mohs surgery procedure	3.0% (9)	N/A
Fear of the sun after Mohs surgery	2.3% (7)	15.0% (3)
Explanation of procedure	2.0% (6)	5.0% (1)
Fear of having cancer	0.7% (2)	N/A

lesions. 57 of 302 Instagram posts (18.9%) included spreading awareness of skin cancer and encouraging others to protect their skin, whereas tweets most often involved updating followers on treatment progress (30%). Both platforms were frequently used to discuss appearance while recovering from treatment. This correlates with the great majority of patients posting about their Mohs surgery experiences post-surgery on Instagram (91.4%) and Twitter (75%). In addition, the vast majority of Mohs surgery posts were posted by women (Instagram: 93%; Twitter: 65%). This is consistent with a study performed on gamma knife radiosurgery which found that the majority of social media posts related to this procedure on both Instagram and Twitter were posted by females [4].

Our finding that the majority of posts were made by women may be due to the fact that female Internet users use social networking sites more often than men [2]. The higher number of pre-Mohs surgery posts on Twitter (25%) compared to Instagram could be due to the fact that it is an easier platform to quickly share one's thoughts without an associated picture. However, more users still posted post-surgery on both platforms, which is also consistent with the frequency of pre-/post-procedure posts found in studies pertaining to other specialties [4].

Mohs surgery is a procedure commonly performed on the face, which is an area of great concern regarding patient appearance following Mohs surgery [7]. Our analysis revealed that many patients voiced concern regarding both their appearance acutely during recovering (11.6%) and scarring later (10.3%) on Instagram. On Twitter, prominent themes included recounting presentation of symptoms (15%) and discussing fear of sun post-surgery (15%), with 30% of

tweets falling into one of these two categories. It is likely that patients who post about their Mohs surgery experiences on social media have undergone feelings of fear of cancer and regret of past skin safety habits. Our thematic analysis reveals that social media could potentially be a platform for patients to spread awareness of skin cancer and educate others on skin safety via posts about their personal experiences.

Social media has utility as a platform for support networks in addition to education. As the patient's perspective of their healing process after Mohs surgery influences both perception of care and quality of life, post-procedural discourse seen under comments of Instagram posts may be useful for patients at risk for skin cancer or those undergoing their first Mohs surgery experience [7]. Pre-procedure visualization may aid patients and social media users by promoting skin cancer awareness and motivating certain populations to receive regular skin checks. Additionally, such posts can help to prepare patients understand what to expect both during surgery and the recovery process which adds insight into what they are told by their physicians. This evaluation of patients' real-time thoughts and reactions lends itself to be a beneficial reflection of features of the patient experience which may not be fully captured through formally requested feedback by the physician.

This study contributes to the limited data on social media as a platform for patients to convey their opinions and experiences within the field of dermatology. It demonstrates that there is potential for using individual patient experiences to spread awareness and educate others on disease prevention within a particular sub-set of dermatologic procedures such as Mohs surgery. Limitations of this study include the restrictions of 140 characters for tweets and 2200 for

Instagram captions. This requires individuals to maintain a certain level of brevity in their posts, thus information on details from their experience may not be captured in posts. Another limitation is only being able to analyze Instagram and Twitter posts on accounts that were on the public profile setting; we cannot see posts on private accounts.

Furthermore, there are demographic limitations in this study. In a survey study conducted by the Pew Research Center, the highest percentage of Internet users who use social networking sites is in the age group of 18–29 years, with 83% of this group using social networking sites such as Instagram and Twitter [2]. In comparison, the average age of patients receiving Mohs surgery is 68.4 years [6]. Given that social media generally appeals to younger populations, they are more likely to utilize social media as a tool for sharing experiences and education. Additionally, a study of Mohs surgery patients found that the ratio of men to women undergoing Mohs surgery was 1.7:1 [6]. This demographic finding of more men than women receiving Mohs surgery proposes a limitation since our analysis found that women comprise the majority of persons posting about their Mohs surgery experiences. However, there is a growing population of patients under 50 years old with nonmelanoma skin cancer needing Mohs surgery, especially women with basal cell carcinoma [10]. Therefore, our study likely represents a population that is growing in Mohs surgery referrals.

## Conclusion

Thematic analysis of social media posts can be a reproducible, standardized method for surveying patient experiences and what they document online [3, 4, 11]. Major social media platforms have the ability to serve as outlets for patients to educate others on important dermatological issues, such as sun safety and skin cancer prevention, by sharing their own personal experiences, including niche fields such as Mohs surgery.

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## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

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