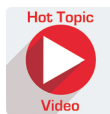


Can You Trust What You Watch? An Assessment of the Quality of Information in Aesthetic Surgery Videos on YouTube

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Background: Videos on YouTube can be posted without regulation or content oversight. Unfortunately, many patients use YouTube as a resource on aesthetic surgery, leading to misinformation. Currently, there are no objective assessments of the quality of information on YouTube about aesthetic surgery.

Methods: YouTube was queried for videos about the 12 most common aesthetic surgical procedures, identified from the 2015 American Society of Plastic Surgeons procedural statistics between May and June of 2016. The top 25 results for each search term were scored using the modified Ensuring Quality Information for Patients criteria based on video structure, content, and author identification. Average Ensuring Quality Information for Patients score, view count, and video duration were compared between authorship groups.

Results: A total of 523 videos were graded after excluding duplicates. The mean modified Ensuring Quality Information for Patients score for all videos was 13.1 (SE, 0.18) of a possible 27. The videos under the search “nose reshaping” had the lowest mean score of 10.24 (SE, 0.74), whereas “breast augmentation” had the highest score of 15.96 (SE, 0.65). Physician authorship accounted for 59 percent of included videos and had a higher mean Ensuring Quality Information for Patients score than those by patients. Only three of the 21 search terms had a mean modified Ensuring Quality Information for Patients score meeting criteria for high-quality videos.

Conclusions: The information contained in aesthetic surgery videos on YouTube is low quality. Patients should be aware that the information has the potential to be inaccurate. Plastic surgeons should be encouraged to develop high-quality videos to educate patients. (*Plast. Reconstr. Surg.* 145: 329e, 2020.)

The Internet provides patients with easy access to an abundance of medical information, and an increasing number of patients are using the Internet as a source for this purpose.¹ This trend holds true for patients considering cosmetic surgical procedures.² Previous studies have demonstrated that many patients desiring cosmetic surgery will use the Internet to gain information about certain procedures before even meeting a plastic surgeon.³ Most patients that use the Internet to gain health information claim that

their findings influence their ultimate treatment decisions.⁴

Social media have been increasingly used and studied by patients and plastic surgeons, especially in the aesthetic realm, as a marketing tool and to enhance patient education. Benefits to surgeons

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include increasing the patient's perception of the surgeon's expertise, public relations, professional networking, fostering direct patient-physician interaction, contributing to the dialogue about medicine and current developments, and disseminating cutting-edge research.⁵ Given the rise in popularity, it has also been increasingly studied in the literature. Four-fifths of the U.S population uses social media, and the average person spends approximately 2 hours per day using social media outlets, so it is imperative that the information posted on these forums be high quality and professional.⁵ Although the impact of social media on the field of plastic surgery is ever-growing and continues to be defined, the literature suggests that this powerful tool will continue to be increasingly used by patients and physicians.

The popular video-sharing website YouTube contains many videos pertaining to cosmetic procedures. Over the past few years, an increasing number of patients have searched YouTube to seek medical knowledge.⁶ Although YouTube is primarily a commercial website for entertainment purposes, patients nonetheless will seek out information about plastic surgery here before in-office consultation. The videos on YouTube are posted by numerous sources (including physicians, medical groups, patients, and various medical businesses), are not peer reviewed, and can have varying degrees of accuracy with regard to content because there is no oversight on video content.⁷ This raises the concern as to whether the information provided to patients in these YouTube videos is accurate. With a 115 percent increase in cosmetic procedures since 2000, and more patients using the Internet as a tool to gain medical information than ever before, there is a need for patients to have ready access to reliable information, and an onus on surgeons to evaluate the quality of the content available.^{2,8}

One tool that has been previously used to analyze the quality of medical information provided on the Internet is the Ensuring Quality Information for Patients instrument.⁹ It offers a complete and reproducible grade of the quality of the information. The aim of this study is to use the modified Ensuring Quality Information for Patients scale to determine whether YouTube videos provide adequate information to patients regarding the most popular cosmetic procedure and compare differences in video quality based on search terms (medical or lay term for the same procedures).

METHODS

The 12 most common cosmetic surgical procedures performed in the United States were

determined from the 2015 American Society of Plastic Surgeons National Clearinghouse of Plastic Surgery Procedural Statistics Report.⁸ Because of upward trends, the gluteal fat augmentation procedure was also included, totaling 13 procedure types. Lay terms for these procedures were also included, yielding a total of 21 search terms for related videos on YouTube as follows: abdominoplasty, augmentation mammoplasty, blepharoplasty, breast augmentation, breast lift, breast reduction, breast reduction, buttock augmentation, buttock lift, ear surgery, eyelid surgery, face lift, forehead lift, gynecomastia, liposuction, mastopexy, nose reshaping, otoplasty, rhinoplasty, rhytidectomy, and tummy tuck. The search was conducted between May 25 and June 8, 2016. The first 25 video results autogenerated by YouTube that were determined to be relevant to plastic surgery by the authors for each aesthetic procedure were identified and used for analysis, and non-English language videos were excluded from this study.

Videos were independently reviewed by three authors (A.G., B.J., and P.J.) using a modified version of the Ensuring Quality Information for Patients criteria.^{9–11} This scoring instrument has been validated in the literature for analyzing the quality of written materials provided to patients, and this study modified the criteria for application to scoring videos (Table 1). Twenty-seven different binary variables in three categories were collected and summed to give a total Ensuring Quality Information for Patients score for each video. Descriptions of these variables are listed by category (Table 1). Video length, view count, and authorship category (i.e., physician, patient, or other) were also recorded. Mean Ensuring Quality Information for Patients score, mean video length, percentage of authorship procedure category, and percentage relevant to the search term were determined and averaged among the three reviewers.

Mean Ensuring Quality Information for Patients score, video duration, and relevance were compared among authorship groups for each procedural category using one-way analysis of variance testing and linear regression as appropriate. The average number of views was also compared between physician, patient, or other groups for all procedure types combined. Only the top 25 YouTube searches that were relevant to plastic surgery were scored by the authors and not all 50 videos for each search term; thus, there are some unscored videos that were not able to be included in the data set.

Table 1. Summary of Modified Ensuring Quality Information for Patients Criteria

Content data	
1.	Initial definition of which subjects will be covered
2.	Coverage of the previously defined subjects (NA if no initial definition covered)
3.	Description of the medical problem
4.	Definition of the purpose of the surgical intervention
5.	Description of treatment alternatives
6.	Description of the sequence of the surgical procedure
7.	Description of the qualitative and/or quantitative benefits to the recipient
8.	Description of the qualitative and/or quantitative risks and side effects
9.	Addressed quality-of-life issues
10.	Description of how complications are handled
11.	Description of the precautions that the patient may take
12.	Mentioned alert signs that the patient may detect
13.	Addressed medical intervention costs and insurance issues
14.	Mentioned specific details of other sources of reliable information/support
15.	Coverage of all relevant issues for the topic (summary item for all content criteria)
Identification data	
16.	Date of issue or revision present
17.	Logo of the issuing body present
18.	Names of the persons or entities that produced or financed the video present
Structure data	
19.	Used everyday language and explained complex words or jargon
20.	Used generic names for all medications or products (NA if no medications described)
21.	Personally addressed the viewer
22.	Used a respectful tone
23.	Used clear information (no ambiguities or contradictions)
24.	Balanced information on risks and benefits
25.	Presented information in a logical order
26.	Used clear and relevant figures or graphs (NA if absent)
27.	Included a named space for the reader's note or questions
NA, not applicable.	

RESULTS

After removing irrelevant and duplicate videos, a total of 523 YouTube videos were collected on the 13 most common aesthetic surgery procedures using 21 different lay and medical search terms. From the selected videos, 310 (59.3 percent) were developed by physicians, 108 (20.6 percent) were developed by patients, and 105 (20.1 percent) were developed by other sources. Videos developed by physicians had the highest mean number of views at 437,492.4 (SE, 144,154.1) per video compared to 172,089.6 (SE, 559,74.44) and 291,155.1 (SE, 78,452.97) for patient and other authorship, respectively. (See Table, Supplemental Digital Content 1, which shows the modified mean Ensuring Quality Information for Patients scores, video length, and relevance by search term

and authorship related to the videos that were examined, <http://links.lww.com/PRS/D890>.) The mean video length for each search ranged from 4.47 minutes (SE, 0.71 minutes) with the search term “augmentation mammoplasty” to 12.19 minutes (SE, 2.06 minutes) with the search term “rhinoplasty.”

The eligible YouTube videos collected under each of the 21 search terms were assessed with the modified Ensuring Quality Information for Patients criteria and given mean scores (Fig. 1). The mean modified Ensuring Quality Information for Patients score was 13.1 (SE, 0.18) of a possible 26; none of the assessed videos met all 27 modified Ensuring Quality Information for Patients criteria. Videos were defined as high quality with a score greater than 14.3, which corresponds to the 75th percentile, and low-quality with a score less than or equal to 14.3. Three searches—“breast augmentation,” “eyelid surgery,” and “buttock lift”—scored greater than 14.5 and were classified as high quality, with scores of 15.96 (SE, 0.65), 14.36 (SE, 0.83), and 14.36 (SE, 0.70), respectively (Fig. 1). The lowest score achieved was 10.24 (SE, 0.74) for the YouTube search “nose reshaping.”

With regard to the authorship of the videos, those developed by physicians had higher mean modified Ensuring Quality Information for Patients scores of 14.02 (SE, 0.2), whereas those developed by patients had a mean score of 12.39 (SE, 0.28). Those developed by other sources were even lower, with a mean of 10.47 (SE, 0.65). (See Table, Supplemental Digital Content 2, which shows the overall modified mean Ensuring Quality Information for Patients scores, video length, and relevance by authorship related to the videos that were examined, <http://links.lww.com/PRS/D891>.) Physician authorship did portend an overall high Ensuring Quality Information for Patients score, with 10 of the 21 search terms scoring as high quality (Fig. 2). “Breast augmentation,” “gynecomastia,” and “otoplasty” all had higher mean Ensuring Quality Information for Patients scores for physician authorship than even the highest mean Ensuring Quality Information for Patients score from the overall video cohort.

Specific criteria from the Modified Ensuring Quality Information for Patients criteria including “description of how complications are handled,” “mention of alert signs that the patient may detect,” “addressing medical intervention costs and insurance issues,” “coverage of all relevant issues for the topic,” and “balanced information on risks and benefits” were met in less than 10 percent of the total videos. The criterion most commonly met was

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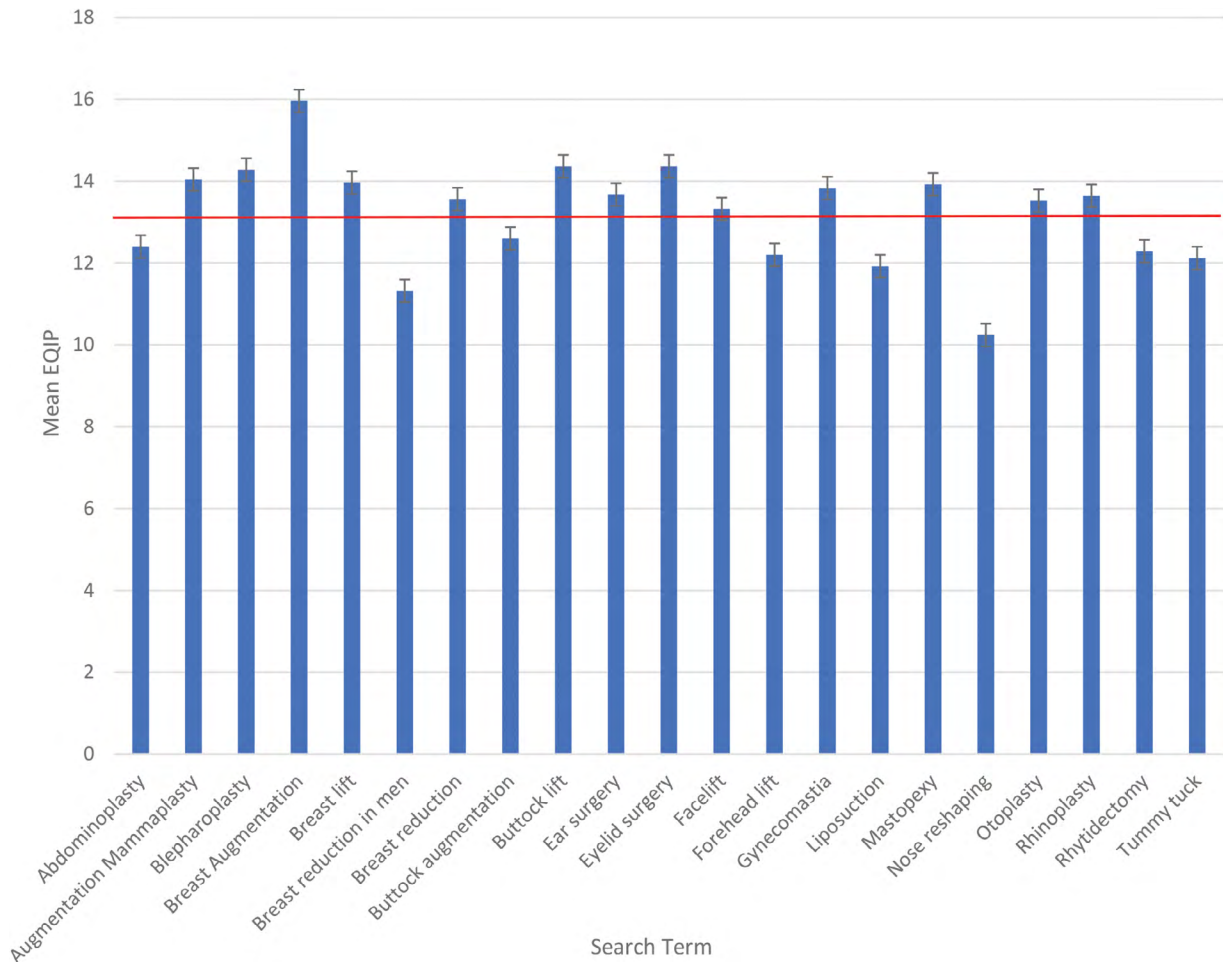


Fig. 1. Overall mean modified Ensuring Quality Information for Patients (EQIP) score by search term. Red line represents overall mean modified Ensuring Quality Information for Patients score for all videos (i.e., 13.18).

the “date of issue or revision,” which was included in 99 percent of the YouTube videos.

The percentage of the top 50 videos for each search term were also evaluated for relevance to plastic surgery based on video content by the reviewers. In six of 21 of the total search terms used in the study, all of the first 50 videos were relevant to plastic surgery (Fig. 3). The search term “ear surgery” had only 24 percent relevant videos to plastic surgery in the top 50 videos, whereas seven search terms had 100 percent relevance to plastic surgery, including abdominoplasty, blepharoplasty, breast augmentation, buttock augmentation, mastopexy, rhinoplasty, and tummy tuck. The mean percentage relevance for each of the 21 search terms was 86.4 percent.

DISCUSSION

To the best of our knowledge, this is the first study to evaluate the quality of information

provided on YouTube pertaining to cosmetic procedures using a validated tool. Overall, the quality of videos posted to YouTube regarding a wider variety of plastic surgical topics is poor. Videos posted by physicians overall provided the best quality information for patients. For several search terms, variability in video quality was present when comparing searches by medical terms versus layperson language. For instance, a search for “rhinoplasty” yielded a higher average Ensuring Quality Information for Patients score than a search for “nose reshaping.” The information most commonly missing from videos included that regarding surgical complications, alert signs, and risk-versus-benefit analysis. The results of this analysis should help guide plastic surgeons when developing and posting videos to YouTube to create informative and comprehensive videos.

In recent years, there has been a rise in the number of patients using YouTube for medical information, not only regarding cosmetic

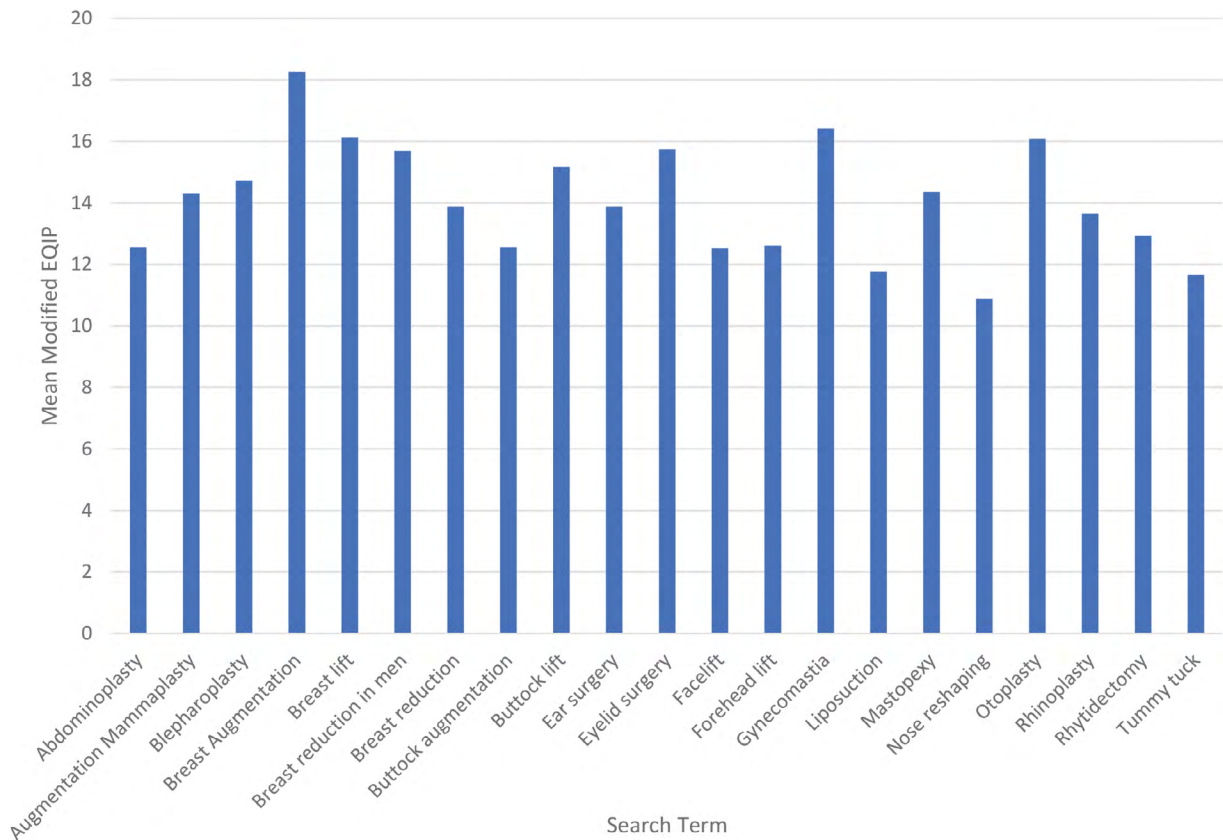


Fig. 2. Mean modified Ensuring Quality Information for Patients (EQIP) score for physician authorship.

procedures, but a wide range of medical treatments and conditions.⁶ As a result, studies in several fields including dermatology, otorhinolaryngology, oncology, and cardiology have been conducted in an attempt to evaluate the quality of information on YouTube being provided to patients in these specialties.^{12–16} One of the largest was a study analyzing 102 YouTube videos on pediatric adenotonsillectomies and ear tube operations for quality, accuracy, comprehensiveness, and procedure-specific content.¹³ Based on their results, the authors concluded that the quality of information on YouTube regarding adenotonsillectomies and ear tube operations was low. The videos were found to lack information on indications for surgery and the risks associated with tonsillectomies and adenoidectomies. Similarly, though previously not investigated, the results of our study suggested that the overall quality of YouTube videos related to cosmetic procedures is low, and videos frequently neglect to include answers to questions regarding the procedure risks, alert signs, and handling of complications.

The impact of social media on the plastic surgery community is variably reported, and there is a paucity of quantitative data in the literature.

Most studies are qualitative or survey-based, lacking objectivity. However, there have been some interesting insights reported as to the perception of social media in the field of plastic surgery. In one survey-based study, 50.4 percent of plastic surgeons used social media in their professional practice, and 33.8 percent reported a positive impact.¹⁷ Wheeler et al. surveyed aesthetic plastic surgeons and found that 28.2 percent of respondents used social media in their practice, and mostly only if practicing solo in larger cities.¹⁸ Another study, composed of patient surveys, revealed that 9 percent of patients were influenced by YouTube videos when choosing a plastic surgery practice, with most patients very interested or interested in short videos, either educational videos or videos of treatments. Videos were the content that 10 percent of patients most wanted to see in this study.¹⁹ These results highlight that YouTube has the potential to be a valuable tool if used correctly and ethically.²⁰

We do recognize that the primary purpose of YouTube is for commercial use and entertainment. Nevertheless, it does appear that patients respond to what they see on social media and their decisions are influenced by this information, be it

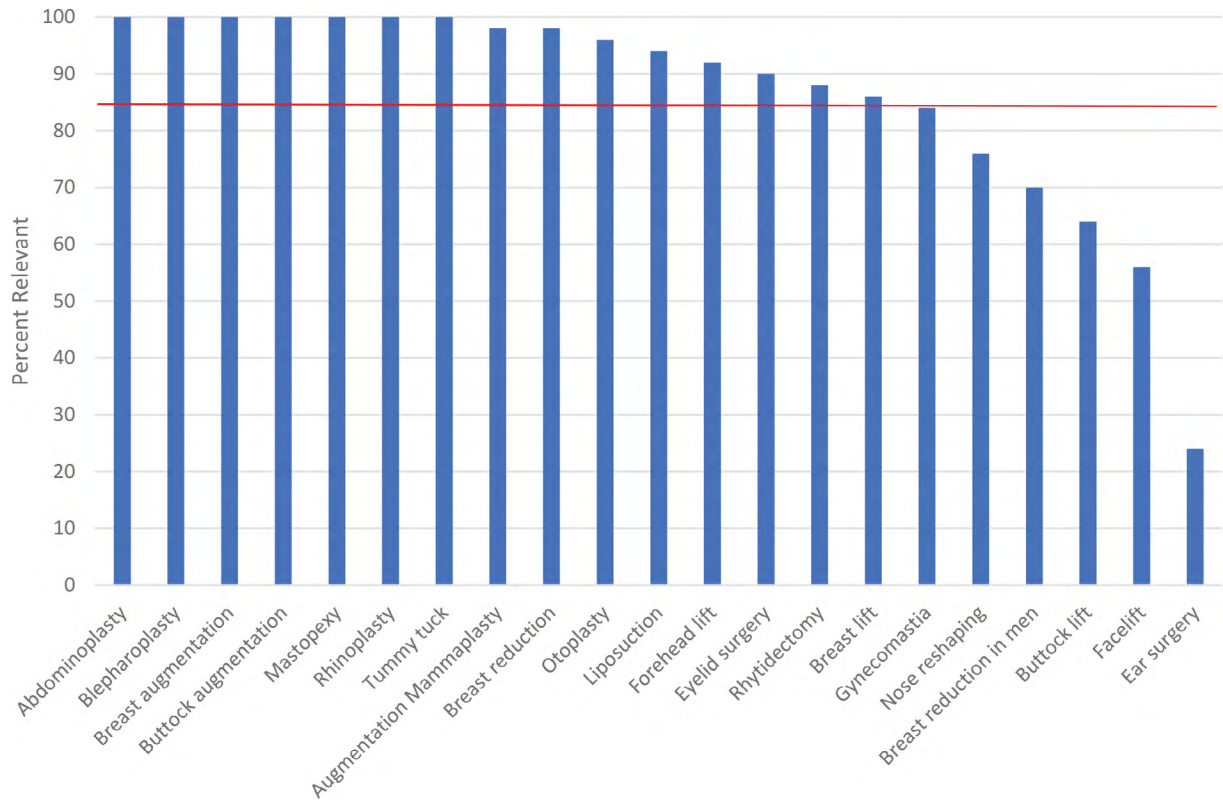


Fig. 3. Percentage of relevant videos for each search term. Red line represents the mean percentage relevance of all videos (i.e., 86.4 percent).

right or wrong. An analysis of over 300 plastic surgery posts in social media demonstrated that educational content accounted for only 16 percent of total posts, and YouTube videos were created by plastic surgeons only 13 percent of the time in their cohort.²¹ Furthermore, this analysis demonstrated that posts containing videos generated the most buzz in the social media community in the form of likes, shares, or comments, highlighting the impact that social media have on the public perception of plastic surgery. Unfortunately, these results also reinforced the fact that YouTube and other social media platforms run rampant with shaming, sexualization of women, jokes, and celebrities. This further reveals that content producers can be incentivized to create videos with a high view count by using these tactics, and there is no motivation to produce high-quality, impartial, or educational content.²¹ A recent survey about the public’s views of plastic surgery in social media was crowdsourced; the survey found that 46 percent of respondents would start with Google when looking for a plastic surgeon, which may also include YouTube videos by means of the video search engine. In addition, social media sites, including Facebook, Twitter, Instagram, and

YouTube, were the most influential online materials in selecting a plastic surgeon for the public.²²

Our study further highlights the availability of videos and other resources on social media platforms while also assigning an objective measure on the quality of the content. It is imperative that the information in these videos be accurate and balanced and addresses the most important aspects of the procedure described. Irrespective of the intended purpose of YouTube being primarily for entertainment, the average person seeking cosmetic surgery may take this information into account when choosing an aesthetic procedure and interpret what they see as factual. To help battle the spread of misinformation to patients, as plastic surgeons, we should control the messaging by providing high-quality content.

The modified Ensuring Quality Information for Patients instrument, which we used as a model for our scoring system, is an expanded version of the original Ensuring Quality Information for Patients tool and has been found to have a high interrater reliability (mean kappa = 0.84).⁹ The instrument is specifically designed to evaluate the quality of patient information and was a convenient and effective resource for the purposes of

our study. The modified Ensuring Quality Information for Patients instrument has been used previously to assess the quality of patient information found on the Internet relating to cosmetic procedures; however, to date, no study has used this tool to evaluate the quality of social media posts or YouTube videos.¹⁰

A 2016 study scored 245 websites found by searching the keyword “liposuction” with the modified Ensuring Quality Information for Patients criteria.¹⁰ The authors’ findings, based on the criteria from the modified Ensuring Quality Information for Patients instrument, concluded that the overall quality of information on liposuction was poor and that the websites developed by private practice surgeons were of the lowest quality. Interestingly, we also identified YouTube videos on liposuction authored by physicians to be of lower quality compared to those authored by patients (11.76 ± 1.04 versus 12.75 ± 2.36). Despite this, the overall highest quality information on cosmetic surgery videos was provided by physicians, making liposuction an anomaly.

Social media continue to be increasingly used in our society, but studies suggest that plastic surgeons may be hesitant to incorporate this useful tool in their practice. A recent questionnaire sent to American Society of Plastic Surgeons members demonstrated that 71.9 percent of nonacademic plastic surgeons had an active professional social media account versus 29.5 percent of academic surgeons. Nonacademic surgeons, especially younger, cosmetic, breast reconstruction, and pediatrics/craniofacial surgeons, were also more likely to view social media as a positive influence for the field compared to academic physicians. The authors suggest that although most plastic surgeons use social media for marketing or branding, they could have further applications for education of the public and for promoting collaboration and innovation between private practice and academia.²³ This benefit would hinge on the quality of the material presented on these platforms.

The results of this study have exposed the need for more informative and educational YouTube videos in the field of cosmetic surgery. This is especially the case when it pertains to addressing the risks of procedures. As patients increasingly use YouTube to gain medical information, it is pertinent that risks, indications, and side effects of procedures are addressed with accuracy. The exclusion of this information from many videos may be attributable to a lack of knowledge on the topic, particularly when the video is produced by a

patient or by nonmedical personnel. It is also plausible that some of the physicians posting videos on YouTube are doing so to recruit patients to their practice, and discussing potential complications on the Internet could potentially deter them from seeking cosmetic surgery. These findings suggest that the current videos found on YouTube related to cosmetic procedures are not comprehensive. Knowing this, physicians can better direct patients to resources that fill in these gaps of knowledge. Furthermore, our results can be used as a guide for physicians posting on YouTube to target their videos at addressing not only the benefits but also the risks of cosmetic procedures.

Although it is the first of its kind to report on this topic, there are several limitations to this study. First, videos in a language other than English were excluded, and as such, the information from 21 of the videos from our search is unaccounted for. Second, given the large number of videos, the use of multiple reviewers could have resulted in subjective scoring differences in scoring of some of the videos. However, this is somewhat mitigated by use of a validated scoring instrument to decrease the interreviewer variability in video scoring. Furthermore, because the content available on YouTube is constantly changing, the top 25 videos for each procedure that we watched during the month we conducted our search may not all remain within the most relevant videos for the corresponding topic, even within the next month. Another limitation is that anyone can post videos on YouTube claiming to be a physician. When looking specifically at videos authored by physician on YouTube, we did not inquire into whether the physician was board certified, board eligible, or trained at an accredited plastic surgery program. This is an important distinction that was not recorded in our data set and as such may have affected the quality of the physician videos we analyzed. Finally, the Ensuring Quality Information for Patients instrument is designed not for the analysis of videos specifically but instead for written health care information. Because of this, we removed nine of the criteria from the Ensuring Quality Information for Patients 36 scale from our scoring system because they were not applicable for the evaluation of videos.⁹ Because of its focus on the quality of patient information and lack of a similar validated tool to assess information in videos specifically, the modified Ensuring Quality Information for Patients instrument is a starting point for the assessment of YouTube videos related to cosmetic procedures. The use of this instrument by the video publishers, particularly the plastic surgeons, would help

ensure that patients have access to high-quality information when searching YouTube.

Future directions by our institution include plans to use crowdsourcing data in addition to Google Trends to evaluate the public perception of plastic surgery. Given the recent rise of Instagram use in the plastic surgery community and ability to post videos on this platform, a study using the modified Ensuring Quality Information for Patients to score these videos objectively may also provide insight into the quality of information by plastic surgeons presented to the lay public.

CONCLUSIONS

As many patients are now using the Internet—specifically, the video-sharing site YouTube—for medical guidance, it is vital that the information they are presented with is of high quality. The present study has shown that information found in YouTube videos pertaining to the most common cosmetic procedures in the United States is often inadequate, with a majority of videos not containing any discussion of the risks or complications associated with various procedures. There is a need for informative and accurate videos to help patients considering undergoing cosmetic surgery make informed decisions.

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