

# Otoplasty Online Information: A Comprehensive Analysis of the Websites and Videos that Patients View Regarding Cosmetic Ear Surgery

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## Abstract

Physicians should be aware of both websites and videos available online regarding the otoplasty procedure to provide quality care. This study systematically analyzes the authorships, reliability, quality, and readability of the websites, as well as the authorships and primary objectives of the videos regarding otoplasty. Validated instruments were used to analyze the reliability, quality, and readability of websites, and videos were systematically categorized and analyzed. A Google search was conducted, and the first five pages of results were included in this study. After excluding unrelated websites, the remaining 44 websites were categorized by authorship (physician, patient, academic, or unaffiliated) and were analyzed using the validated DISCERN instrument for reliability and quality, as well as various other validated instruments to measure readability. A YouTube search was also conducted, and the first 50 relevant videos were included in the study. These videos were categorized by authorship and their primary objective. Website authorships were physician-dominated. Reliability, quality, and overall DISCERN score differ between the four authorship groups by a statistically significant margin (Kruskal–Wallis test,  $p < 0.05$ ). Unaffiliated websites were the most reliable, and physician websites were the least reliable. Academic websites were of the highest quality, and patient websites were of the lowest quality. Readability did not differ significantly between the groups, though the readability measurements made showed a general lack of material easily readable by the general public. YouTube was likewise dominated by physician-authored videos. While the physician-authored videos sought mainly to inform and to advertise, patient-authored videos sought mainly to provide the patient's perspective. Academic organizations showed very little representation on YouTube, and the YouTube views on otoplasty videos were dominated by the top 20 videos, which represented over 93% of the total views of videos included in this study.

## Keywords

- otoplasty
- DISCERN
- readability
- websites
- videos
- online information
- patient education
- Google
- YouTube

The Internet has become a major source of medical information for patients, as it is a very effective tool for disseminating information across a wide audience. In fact, over 60% of the population of western nations are Internet users.<sup>1</sup> Seventy-two percent of patients use the Internet to obtain medical information, and 80% of those patients begin with a search engine, such as Google.<sup>2</sup> For surgical procedures like otoplasty, YouTube is an invaluable source to patients, as it delivers an audiovisual representation of the procedure, which text-based websites cannot provide. The elective nature of the procedure further emphasizes the need for patients to be fully informed of the benefits and risks of the procedure and affords them time to conduct their own research on the topic.<sup>3,4</sup>

Otoplasty is very popular among young people, as it makes up 28% and 30% of facial plastics procedures for 13- to 19-year-olds and 20- to 29-year-olds, respectively.<sup>5</sup> These age groups also have an increased likelihood to use the Internet to seek health-related information, further emphasizing the need for quality information online regarding otoplasty. In fact, studies have shown that young people with auricular deformities face increased levels of stress, often owing to bullying and exposure to cruel environments. This results in poor school performance, decreased social participation, and lower self-confidence.<sup>6</sup> Because otoplasty has been shown to have the potential to provide significant psychological and psychosocial improvements,<sup>7</sup> it is imperative for those seeking for resources online to be adequately and understandably informed on the topic.

Though the Internet is a fast and easily accessible avenue for patients to learn about otoplasty, it suffers from a general lack of oversight and regulations. Websites providing information regarding the procedure often belong to entities that provide the service, resulting in an inherent conflict of interest. Online medical information has also been shown to suffer from false advertising,<sup>8</sup> lack of readability,<sup>9</sup> and a scarcity of instruments available to patients to ensure quality and accuracy of information.<sup>10,11</sup>

For these reasons, it is imperative that surgeons providing otoplasty services are aware of the websites and videos that their patients view regarding this procedure. This study methodically examines the reliability, quality, and readability of websites related to otoplasty, as well as the primary objective of the videos regarding the procedure, and provides a systematic analysis relating these factors to authorship of the various online sources.

## Methods

A Google search of "otoplasty" was performed in Chicago, Illinois, and the first 5 pages of results, which comprises 50 websites, were included in this study, as patients are unlikely to look beyond the first five pages of results.<sup>12,13</sup> Any results unrelated to the otoplasty procedure were excluded, leaving 44 websites to be analyzed.

These websites were divided into four authorship groups: physician, patient, academic, and unaffiliated. The physician group encompassed both individual physicians and private clinics; the patient group included patients or potential

patients of the otoplasty procedure; the academic group included websites sponsored by both professional organizations and institutions of higher learning; and the unaffiliated group included news articles and encyclopedia articles.

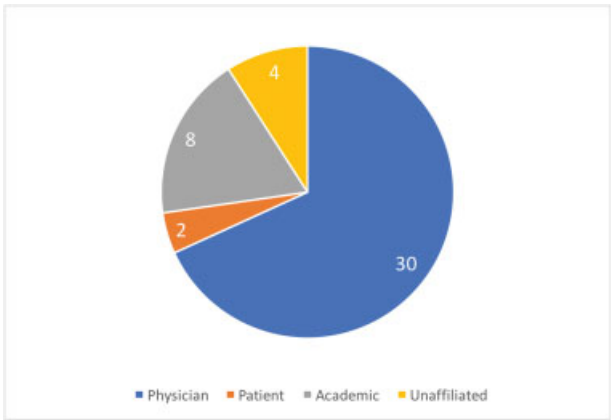
The validated DISCERN instrument was used to calculate the reliability, quality, and overall score for each website. This instrument asks a series of objective questions to the reviewer, who provides answers on a 1 to 5 scale. For this study, a simplified 1 to 3 scale was used, with "3" indicating higher reliability or quality.

Readability of websites was also calculated using a series of measures: Gunning Frequency of Gobbledygook (GFOG), Flesch-Kincaid Grade Level (FKGL), the Coleman-Liau Index (CLI), Simple Measure of Gobbledygook (SMOG), Automated Readability Index (ARI), and the Linsear Write formula. These scales take into account word length and sentence length, among other factors, to represent the readability of a page of text as a standard US grade level.

A YouTube search of "otoplasty" was performed in Chicago, Illinois, and the first 50 videos relevant to the otoplasty procedure were included in this study. Excluded videos included a commercial for a product unrelated to otoplasty and a procedure not related to otoplasty. Videos were then divided into four authorship groups using the same procedure as that for websites described above.

The videos were then viewed, the view count of each video was noted, and the primary objective of each video was identified. The three primary objectives were to inform, to provide the patient's perspective, and to advertise. The criteria for placement in one of these categories have been previously described<sup>14</sup> and are reiterated below:

1. **To inform:** Videos that provided information regarding the otoplasty procedure were assigned this primary objective. Videos in this category may include images of the procedure itself, information from a physician or other source, or information on alternate procedures. Videos in this category may include the contact information of the pertaining physician or clinic, but do not make any direct written or verbal recommendation for the viewer to schedule a consult with any particular physician. Videos in this category also do not offer a favorable perspective of one physician's work in comparison to a "norm." Videos in this category also do not offer "pros" regarding the otoplasty procedure without accompanying "cons."
2. **To provide the patient's perspective:** Videos that provided the unadulterated perspective of an otoplasty patient were assigned the primary objective "to provide the patient's perspective." Videos in this category may include a patient discussing his/her experiences regarding any aspects of the procedure. Videos in this category may not show any clear signs of physician-sponsorship, such as the patient reading from a script. Videos in this category may include the contact information of the pertaining physician or clinic, but do not make any direct written or verbal recommendation for the viewer to schedule a consult with any particular physician. Videos in this category also do not offer a favorable perspective of one physicians'



**Fig. 1** Authorship of otoplasty websites.

work in comparison to a “norm.” Videos in this category also do not offer “pros” regarding the otoplasty procedure without accompanying “cons.”

- 3. **To advertise:** The primary purpose of videos in this category is to promote one specific physician or clinic. Videos that fall into this category fail to meet one or more of the exclusion criteria in categories one and two.

**Statistical Analysis**

Comparison of continuous variables was performed using Kruskal–Wallis tests, with threshold for significance set at  $p < 0.05$ . SPSS version 20 (IBM Corp.) was used for statistical calculations.

**Results**

The authorship of websites was physician-dominated, as 30 websites (68%) were authored by physicians or private clinics. Two websites (5%) were authored by patients, eight websites (18%) were authored by academic organizations, and four websites (9%) were authored by unaffiliated curators (→ Fig. 1).

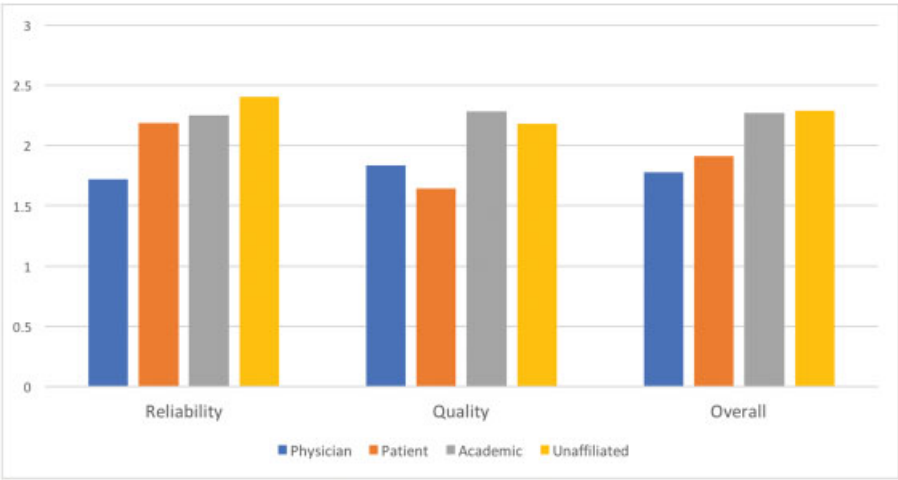
Reliability, quality, and overall DISCERN score differ between the four authorship groups by a statistically significant margin

(Kruskal–Wallis test,  $p < 0.05$ ). Unaffiliated websites were the most reliable ( $2.4 \pm 0.4$  on a 1–3 point scale), followed by academic websites ( $2.3 \pm 0.4$ ), patient websites ( $2.2 \pm 0.1$ ), and physician websites ( $1.7 \pm 0.1$ ), respectively. Academic websites were of the highest quality ( $2.3 \pm 0.4$ ), followed by unaffiliated websites ( $2.2 \pm 0.2$ ), followed by physician websites ( $1.8 \pm 0.3$ ), and patient websites ( $1.6 \pm 0.1$ ), respectively. Overall scores, which take into account both reliability and quality, ranged from  $1.8 \pm 0.1$  for physician-sponsored websites to  $2.3 \pm 0.3$  for both academic and unaffiliated websites. Patient websites scored slightly better than physician websites overall, averaging  $1.9 \pm 0.1$  (→ Fig. 2).

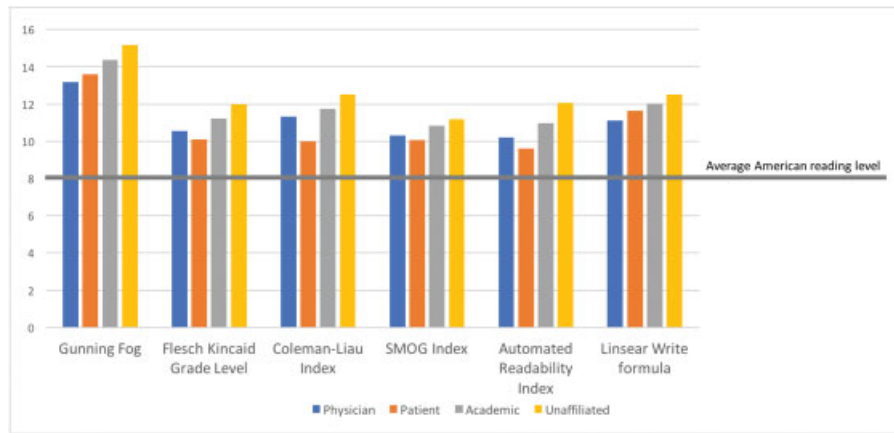
Readability did not differ significantly between the groups for any of the readability scales implemented. The most readable group of websites was determined to be patient websites, with a grade level of 10.8 as measured by averaging the grade level scores of all the instruments, followed by physician-authored websites (11.1), followed by academic websites (11.9), and finally unaffiliated websites (12.6), which proved to be the least readable (→ Fig. 3).

Like the websites analyzed, YouTube was also dominated by physician-authorship. Twenty-seven videos (54%) of the 50 analyzed were physician-authored, sixteen (32%) were patient-authored, one (2%) was authored by an academic organization, and six (12%) were authored by unaffiliated organizations (→ Fig. 4).

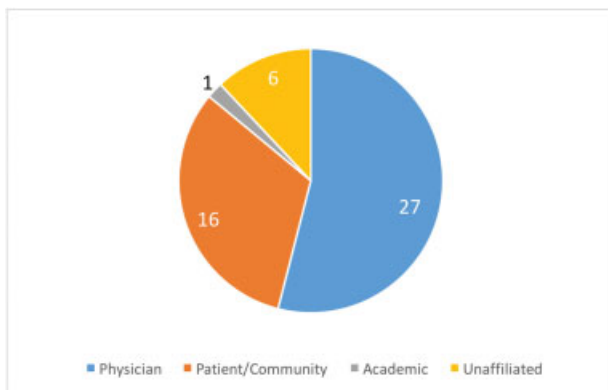
The primary purpose of physician-authored videos was split between informing and advertising. Of physician-authored videos, 11 (41%) sought mainly to inform; 1 (4%) sought mainly to provide a patient’s perspective, and 15 (56%) sought mainly to advertise. Patient-based videos primarily focused on the patient’s perspective; of patient-authored videos, 15 (94%) provided the patients’ perspective, and the primary purpose of 1 video (6%) was to advertise. The single academic video that was studied had the primary purpose to inform. Of the unaffiliated videos studied, two (33%) sought to inform, and four (67%) sought primarily to advertise (→ Fig. 5). Primary purpose, view count, and search rank were not shown to differ with statistical significance between the four authorship groups.



**Fig. 2** Reliability, quality, and overall DISCERN score for otoplasty websites.



**Fig. 3** Readability of otoplasty websites represented by grade levels as measured by various readability scales.



**Fig. 4** Authorship of otoplasty videos.

The YouTube viewership for otoplasty was dominated by the top 20 videos, which represented over 93% of the total views of videos included in this study (►Fig. 6).

## Discussion

Academic sources are often underrepresented in Google searches for facial plastic surgery procedures.<sup>9</sup> However, the eight academic websites in this study represented 18% of the 44 total websites included, a significant portion, coming second only to physician-based websites. In fact, three academic websites appeared on the first page of results, occupying positions one, three, and seven in the Google search. Importantly, these academic sources scored high for both reliability and quality, resulting in an overall DISCERN score of 2.3. Unfortunately, physician-based websites proved to have the lowest overall DISCERN score of 1.8, indicating a deficiency of both reliability and quality. Compounding this deficiency is the fact that physician-based websites make up the majority of the Google search results, 68% in this study.

Physician websites suffered particularly in the category of reliability, where they earned an average score of 1.7—the only group to score below two for this metric. Reliability score evaluates a website's ability to have clear aims, achieve those

aims, be relevant, cite sources, provide a date of publication, be unbiased, provide additional sources of information, and refer to areas of uncertainty regarding the topic. In contrast with websites from other sources, physician-based websites most often scored "1" for citing sources, providing a date of publication, being unbiased, providing additional sources, and referring to areas of uncertainty. Unfortunately, these shortcomings further emphasize the inherent conflict of interest present when surgeons present information to potential patients regarding a particular procedure—the lack of additional sources of information, for instance, may stem from a desire to appear as the authority on the topic or to prevent redirecting traffic away from their website.<sup>9</sup>

Readability did not differ between the authorship groups by a statistically significant margin; however, there did exist a general lack of readability for all groups by all six metrics used to convert readability to a standard U.S.-grade level; the average reading level for adults in the United States correlates to the eighth grade level,<sup>15,16</sup> and for this reason, the National Institutes of Health recommends that online health information be written at the fourth to sixth grade levels.<sup>16–19</sup>

No group of websites scored lower than a ninth grade level on any scale. ►Fig. 3 emphasizes how unreadable these websites are for the general public and that readability improvements should be made for websites of all categories. For website curators, the benefits are two-fold: not only does this increase the size of the audience that the Web site can inform, but may also result in increased patient compliance.<sup>20</sup>

The considerable representation that academic sources have for websites was not shown to be true for videos on YouTube, where only 1 of the 50 included in this study came from an academic source. Physicians curated 54% of YouTube videos in this study, once again indicating a physician-dominated online presence. Though primary purpose was not shown to differ between groups by a statistically significant margin, ►Fig. 5 shows that physician-based videos are split between informing and advertising. For this reason, it can be difficult for a general audience to identify physician videos that seek primarily to advertise, as there do exist nearly as many physician videos that provide legitimate

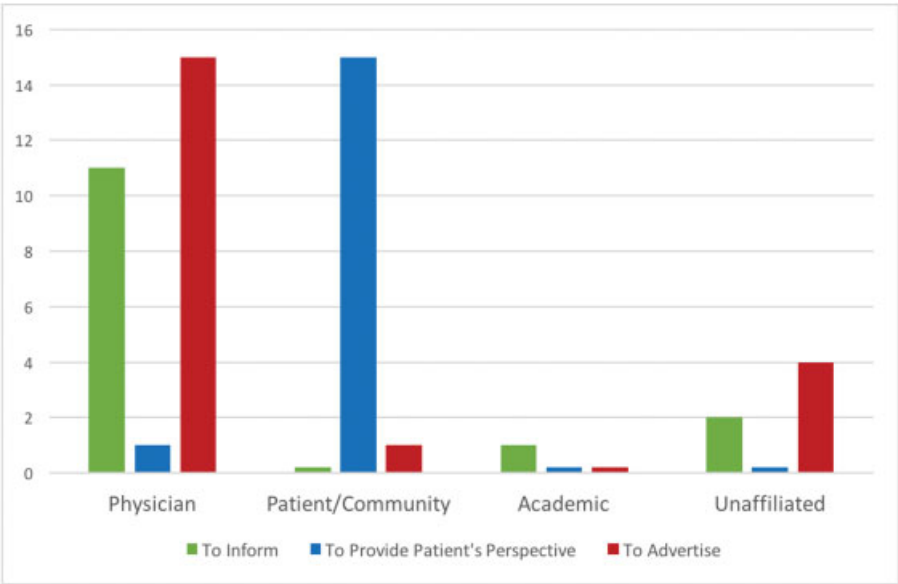


Fig. 5 Primary objective of otoplasty videos of various authorships.

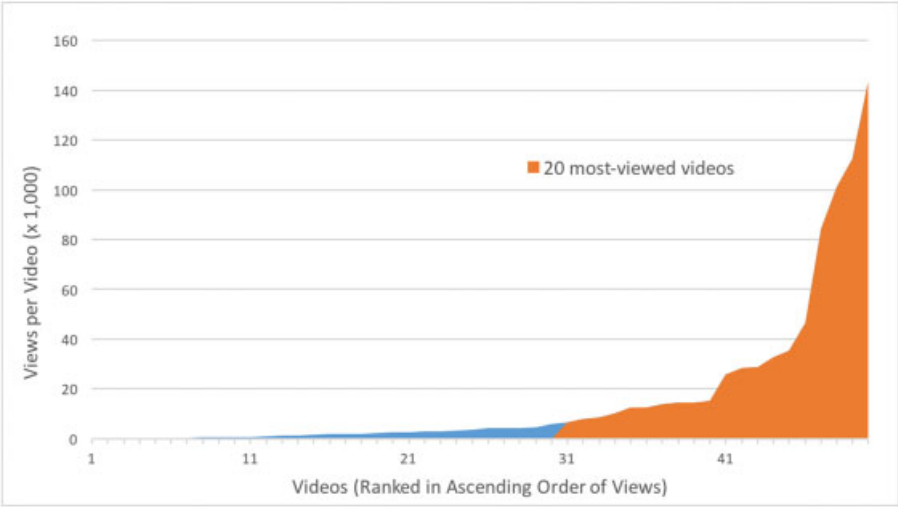


Fig. 6 Distribution of views across otoplasty videos.

information regarding the procedure. One solution for this issue would be a greater YouTube presence of governing and academic bodies, such as the American Academy of Otolaryngology—Head and Neck Surgery (AAO-HNS) and the American Academy of Facial Plastic and Reconstructive Surgery (AAFPRS). Unfortunately, there currently appears only one video from an academic source in the first 50 results on YouTube, and it is intended for a physician audience, as it provides no general information and instead demonstrates a surgical technique.

Further confounding the otoplasty videos on YouTube are non-physician videos that are in fact thinly veiled advertisements from other sources. Our study identified one heavily biased patient testimonial, as well as a news program, that is clearly being used to promote a particular clinic. Both patients and physicians should be wary of these more insidious advertising techniques.

Another important consideration is the fact that the 20 most-viewed videos in this study accounted for over 93% of total views of the 50 otoplasty videos considered. Considering the fact that patients are unlikely to browse beyond the first 50 results, these 20 videos dominate the YouTube viewership regarding this procedure. In addition, only one of these videos is backed by any academic governing body, meaning that the vast majority of videos that patients actually view provide individual, unregulated perspectives.

Though this study is novel in its examination of both website and video sources regarding otoplasty, there exist a few limitations inherent to the design of the study. First, Internet searches are area dependent. Future studies that wish to explore this topic further may consider incorporating search results from different regions across the United States. In addition, search results may change over time—so future studies may also wish to spread their searches out over a period of weeks or months.



## Conclusion

There is an inherent conflict of interest that exists in physician-authored online material, which seeks both to inform and to advertise. In addition, there is a lack of presence of academic organizations in both websites and especially videos to help provide information to patients free of bias. Also, the material that is currently available is not readable for average American audiences, and academic organizations should consider creating new online content that is both reliable and readable. Focusing on readability may be the key for academic organizations to ascertain higher viewership online, which is currently dominated by a very small group of entities.

### Financial Disclosures

None.

### Conflicts of Interest

None. All authors have approved the final manuscript and attest to the integrity of the original data and the analysis reported in the manuscript.

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