Assessment of the quality and reliability of the information on lateral epicondylitis surgery on YouTube

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ABSTRACT

Aim: To investigate the quality and reliability of videos related to lateral epicondylitis (LE) surgery on YouTube® and to define a new scoring system that can be used to assess online information about LE.
Method: To conduct the study, a search on YouTube® using the words "lateral epicondylitis surgery" and "tennis elbow surgery" was conducted on February 15, 2022. The first 100 videos that appeared upon the search were included in the study. The videos were classified based on the type of publishing source as a medical doctor, medical center, and Commercial/Medical media agency. Two authors independently analyzed the videos. The quality and reliability of the videos were examined using DISCERN score, Journal of the American Medical Association (JAMA) score, Health on the Net (HON) score, and a novel YouTube® LE-score (LES). Video Power Index (VPI) and View Ratio (VR) were used to assess the popularity of videos.
Results: A total of 29 videos were included in the study. There was no significant difference between the groups in terms of DISCERN, JAMA, HON, and LES scores. Although the group of medical doctors had much higher VRs and VPIs, there was no significant difference between the groups. LES score was found to be positively correlated with DISCERN, JAMA and HON (rho 0.879, $p < 0.001$; rho 0.709, $p < 0.001$; rho, 0.838, $p < 0.001$, respectively).
Conclusion: The quality and reliability of the online information made available by YouTube® concerning LE surgery had an average level of quality and reliability. In addition, the LES scoring system created by us was highly compatible with the DISCERN and JAMA scoring systems accepted in the literature. It can be used as evaluation scoring in searches about lateral epicondylitis.

Key words: Lateral epicondylitis surgery, YouTube, tennis elbow surgery, online search, information.

Introduction

Access to information is getting easier daily as internet access and smartphone use have become more widespread. Research has shown that the internet search for health-related information has become a common practice worldwide [1]. Video-based information is resorted more than written texts to obtain health-related information. Although YouTube ® was introduced and initially used as an entertainment platform, it is now used as an important resource for obtaining health and health-related information [2]. YouTube ® is

the world's largest open-access video platform and is becoming increasingly popular for obtaining medical information [3]. Consequently, patients use the YouTube ® platform to get information before surgery and learn the relevant surgery risks. Therefore, the video content on YouTube® can affect the patient-doctor interactions as well as treatment compliance and outcome. Some healthcare professionals can also use this platform, such as surgical assistants and young surgeons, to improve their surgical know-how or learn new techniques [4]. However, videos on YouTube® may not have been adequately reviewed, may be faulty in terms of information accuracy, and may not be updated regularly. Therefore, the quality of videos containing information may be unreliable [5, 6]. Low-quality videos lead to negative consequences in terms of the relationship between patient and physician. 38% of physicians believe that information obtained from patients makes a patient's examination process less efficient, and this may consequently affect the processes of deciding treatments for the patient [7].

Lateral epicondylitis (LE) is a painful condition affecting the tendinous tissue that adheres to the lateral epicondyle of the humerus, leading to loss of function of the affected limb [8]. LE is a common cause of upper extremity pain and affects 1-3% of adults [9]. It is often referred to as the 'tennis elbow' but is also associated with repetitive motions such as manual labor and vibrating tools besides sportive activities [10,11]. Patients often complain of pain or burning around the lateral epicondyle of the humerus. Pain is often triggered by movements such as grasping objects or squeezing cleaning cloths, and can spread from the elbow to the forearm [12]. The diagnosis of LE is primarily based on the clinical history and physical examination, but imaging methods can be

employed for differential diagnosis [13]. There are various treatment options ranging from conservative treatment to surgical treatment. Conservative treatment can treat 90% of symptomatic patients [14]. As for those patients who do not benefit from conservative treatment, they are treated surgically.

Lateral epicondylitis surgery can constitute a great social and economic burden due to loss of labor [15]. Given the labor loss it causes, the written information and videos shared on websites about the treatment of this common orthopedic problem can therefore bear significant importance for patients. The widespread use of the internet further increases the importance of online resources. In this regard, it is important that the informative online videos about LE surgery are understood correctly by patients and young healthcare specialists.

Many studies in the literature focus on YouTube® videos that contain health-related information [2,4,16]. However, the number of studies evaluating videos on LE surgery is insufficient. Therefore, the present study is intended to investigate the quality and reliability of the videos about LE surgery on YouTube®. The study also aims to correlate the previously described quality assessment scales with a new LE-specific scoring system that we have developed.

Materials and methods

A search was performed on YouTube®(http://www.youtube.com) on February 15, 2022, using the keywords "lateral epicondylitis surgery" and "tennis elbow surgery" and "relevance-based ranking" was applied as the ranking criterion. The first 100 videos that appeared upon the search were included in the study. Duplicate videos (n = 32), non-English (n = 3), silent (n = 2), non-surgical

videos (n =7), and videos viewed less than 10,000 times (n = 27) were excluded. The study was conducted by the principles of the Declaration of Helsinki and with the approval of the Ordu University Training and Research Hospital Ethics Committee (decision No. 2022/30).

The videos were classified based on the type of publishing source as follows: Medical doctor, Medical center, Commercial/Medical media agency. These categories were identified as follows: Those with a video title or publisher information that contains only the name of a doctor were included in the category of "medical doctor", while other videos with a video title or publisher information that contains names of hospitals, institutes or clinics were included in the "medical center" category, and finally, those videos uploaded by agencies or medical companies were included in the "commercial/ medical media agency" category. The videos were analyzed independently by two authors. The videos were assessed using DISCERN score, Journal of the American Medical Association (JAMA) score, Health on the Net (HON) score and a novel YouTube® LE-score (LES).

DISCERN is a survey designed to assess the quality and reliability of health information. In this scale that consists of 15 questions, each question is scored out of 5, and gives the final score of the video. The first eight questions are about reliability. The next seven questions assess specific details of treatments. In the DISCERN scoring system, videos are grouped as excellent quality (63-75 points), good quality (51-62 points), medium quality (39-50 points), low quality (27-38 points), and very poor quality (16-26 points) [17]. JAMA benchmark was used to assess the accuracy and reliability of the videos. In this assessment, the scoring was based on 4 criteria, which were authorship,

Table 1. Lateral Epicondylitis Score (LES).

Anatomy	1 point
Timing	1 point
Age	1 point
Gender	1 point
Associated pathology	1 point
Clinical diagnosis	1 point
Radiological diagnosis	1 point
Differential Diagnosis	1 point
Functional disability	1 point
Initial management	1 point
Surgical indications	1 point
Surgical contraindications	1 point
Approach	1 point
Position	1 point
Techniques	1 point
Additional procedures	1 point
Description of the immobilization	1 point
Description of the rehabilitation	1 point
Description of complications	1 point
Returning to Sports	1 point
TOTAL	**20 points**

citation, description, and validity, each with a score of 1. 4 points indicate that the source has high accuracy and reliability, while 0 points indicate poor accuracy and reliability [18]. HON score is an assessment method that examines online information to identify their level of transparency and accuracy and aims to improve the quality of health information on the internet. The maximum score is 16 in the HON scoring. A HON score of 12 or above out of sixteen points indicates that a YouTube® video is quite reliable [19]. Since there is no specific scoring for LE surgery in the literature to assess the quality of surgical information, we have created a new YouTube® LE-specific score (LES) based on various pilot studies investigating different orthopedic diseases

[20,21]. In this scoring, one point was given for each criterion and a maximum score of 20 points was obtained at the end (Table 1). Video quality was categorized as excellent (16-20), good (11-15), moderate (6-10), and poor (0-5). Along with the scoring, the following data was also recorded for each video: video title, universal resource locator (URL), video duration (in seconds), time since upload (days), total number of views, number of likes, number of dislikes, video source and like ratio (such as × 100/[like + dislike]), and video power index (VPI). VPI was first described by Erdem and Karaca to assess the popularity of videos [22]. VPI was calculated using the formula [like ratio × view ratio/100].

Statistical analysis

Statistical analyses were carried out using the SPSS version 25.0 program. To reveal whether the variables were normally distributed, they were assessed using the histogram graphs and the Kolmogorov-Smirnov test. The descriptive data was presented as mean, standard deviation, median, and IQR values. Kruskal Wallis Test was used to conduct the intergroup evaluation of the non-normally distributed (non-

parametric) variables. ICC coefficients were provided to show the compatibility between the observers. *P* below 0.05 was considered statistically significant.

Results

A total of 29 videos were included in the study. All of the scoring studies were analyzed independently by the two authors. The ICC coefficients for the observers were 0.99 for LES, 0.94 for JAMA, 0.98 for DISCERN scores, and 0.99 for HON and proved excellent reliability. According to the DISCERN scoring, four (14%) of the videos were excellent, seven (24%) were good, twelve (42%) were moderate, three (10%) were poor, and three (10%) were very poor. The LES scores revealed that 4 videos (14%) were excellent, nineteen (65%) were good, and six (21%) were moderate. In the LES scoring, there were no videos that scored poorly. The publishing source was a medical doctor in nineteen videos (65%), a medical center in eight videos (28%), and a commercial, medical media agency in two videos (7%). There was no significant difference between the groups in terms of DISCERN, JAMA, HON,

Table 2. Comparison of the video sources and scores.

Parameters	Medical doctor (n=19)		Medical center (n=8)		Commercial, medical media agency (n=2)		p
	Mean ± SD	Median (IQR)	Mean ± SD	Median (IQR)	Mean ± SD	Median (IQR)	
DISCERN score	50,00±11,06	50 (45-55)	50,00±16,69	52,5 (37,5-60)	40,00±14,14	40 (30-50)	0,573
JAMA	3,11±0,66	3 (3-4)	2,88±0,99	3 (2,5-3,5)	2,50±0,71	2,5 (2-3)	0,492
HON	11,16±1,92	12 (10-12)	11,50±3,16	12 (10-13)	10,00±2,83	10 (8-12)	0,620
LES	13,37±2,52	14 (12-15)	13,63±3,42	14 (11,5-15,5)	11,00±4,24	11 (8-14)	0,589
VPI	39,90±51,40	18,8 (9,44-40,06)	11,21±7,35	9,96 (6,42-12,81)	8,67±2,71	8,67 (6,75-10,58)	0,173
VR	42,58±54,90	22,38 (9,84-41,73)	12,24±7,64	10,76 (7,76-14,09)	9,00±2,24	9 (7,42-10,58)	0,179
LR	94,47±4,89	96 (90-100)	91,25±5,87	92,5 (87-94,5)	96,00±5,66	96 (92-100)	0,389

Kruskal Wallis Test (LES: Lateral Epicondylitis Score, VPI: Video Power Index, VR: View Ratio, LR: Like Ratio).

and LES scores (*p*>0.05) (Table 2). Although the like ratio was the highest in the commercial/medical media agency group, this difference was not statistically significant (*p*>0.05). Although the view ratio and the VPI were much higher in the medical doctor group, there was no statistically significant difference between the groups (*p*>0.05). LES score was found to be positively correlated with DISCERN, JAMA and HON scores (rho 0.879, *p* < 0.001; rho 0.709, p < 0.001; rho 0.838, *p* < 0.001, respectively) (Table 3).

Table 3. Correlations of the scores.

Parameters	LES	
	rho	*p*
DISCERN score	0,879	<0,001
JAMA	0,709	<0,001
HON	0,838	<0,001

Discussion

In our study, we demonstrated that particularly those informative videos published by medical doctors and medical centers concerning LE surgery on YouTube® were of moderate quality, while the commercial videos were of poor quality. In addition, when compared in terms of the reliability of the information provided, the videos prepared by medical doctors contained more reliable information, while the reliability of the commercial videos was quite low. The most important finding of our study indicates that the informative YouTube® videos about LE surgery are of moderate quality and reliability. In addition, it has been shown that the assessment based on the new LES system that we have developed and introduced to the literature is consistent with other scoring.

There are many studies in the literature that investigate the quality and reliability of

YouTube® videos [4,20,21]. Ozdemir et al. [4] assessed the quality of YouTube videos about carpal tunnel syndrome surgery. In the assessment where the researchers used the DISCERN (mean DISCERN score was 1.71 out of 5), HON (average HON score was 5.65 out of 16) and JAMA (average JAMA score was 1.76 out of 4) scoring, they found that the content of the videos, in general, was non-adequate and of poor quality, although the videos uploaded by medical centers scored higher. In our study, compared to the videos related to carpal tunnel syndrome surgery, the videos about LE surgery were found to have higher scores of DISCERN (mean DISCERN score was 49.31±12.73 out of 75), HON (mean HON score was 11.17±2.3 out of 16) and JAMA (mean JAMA score was 3.00±0.76 out of 4). Unlike the study by Ozdemir et al., in our study, the JAMA score of the videos published by medical doctors was higher. We found that the quality and reliability of the LE surgery informative videos are more reliable and of higher quality than the videos about carpal tunnel syndrome surgery. Celik et al. [20] evaluated the quality and reliability of the videos about rotator cuff (RC) repair surgery in their study and found that the DISCERN (median 36 [17-65]) and JAMA (median 1[0-2]) scores of the videos prepared by the doctors were significantly higher than the others. However, in general, they stated that online information about RC repair surgery was of poor quality. In our study, we found that the LE surgical videos published by medical centers had a higher DISCERN (52.5 [37.5-60]) score. On the other hand, the videos published by medical doctors had higher JAMA scores (3 [3-4]) than those published by others. Our study shows that, contrary to the study by Celik et al., the LE videos published by medical centers are of better quality.

In addition to the quality and reliability assessment of the videos, they were also assessed for their popularity. To assess the popularity of the videos, VPI and view ratio (VR) calculations were performed. VPI was first defined by Erdem et al. and calculated using the numbers of views and likes [22]. Uzun et al. [21] reported in their study on hallux valgus surgery videos that videos prepared by patients were the most popular group with higher VPI and VR rates. Celik et al. [20] also found that patient-based and commercial videos have significantly higher VPI and VR scores than other sources. Contrary to these studies, the videos published by medical doctors concerning LE surgery had higher VRI and VR scores in the current study. Our study shows that the LE-related videos published by medical doctors are more popular.

Aydin et al. [23] evaluated the first 50 videos that appeared upon the search made typing LE on YouTube and found that there was no significant correlation between the like ratio and the global quality score (GQS), DISCERN, and JAMA. They also stated that the LE-related videos were of moderate quality and competency. In our study, we typed LE surgery as the search term and performed a more specific search, as well as addressing and reviewing the first 100 videos. In our study, the videos were of moderate quality and reliability, which was consistent with the study by Aydın et al. Our study also differs from the one by Aydın et al. for the new YouTube® LE-specific score (LES) system we have developed, which we used to score the videos included herein. We found that the LES scoring correlated positively with DISCERN, JAMA, and HON scores.

There are many publications in the literature that create and use disease-specific scoring to evaluate the quality of videos published concerning various orthopedic problems. Celik

et al. [20] used a novel YouTube®RC-specific score (RCSS) to evaluate the quality of diagnostic and surgical information in rotator cuff surgery videos and found that DISCERN score was positively correlated with RCSS. Cassidy et al. [24] used a novel YouTube ACL Specific Score (ASS) to assess videos about anterior cruciate ligament. Based on some pilot studies for different orthopedic diseases, we created a new YouTube® LE-specific score (LES) and evaluated all of the videos using this scoring system. We also found that the LES scoring was positively correlated with DISCERN, JAMA and HON scores.

Our study has some limitations. First of all, although patients can use different terms when searching websites, we searched using only two terms. The reason we used these terms is that they are the most known terms. The second limitation of our study is, given that YouTube® and the internet are dynamic environments, we were able to evaluate the quality and reliability of these videos at only one specific point in time, so different results can be obtained with a similar search conducted at a different time. The third limitation of our study is the number of videos evaluated. If the number of evaluated videos were more, statistically significant results could be obtained. Therefore, the first 200 videos could be evaluated. However, most users use information from the first three pages of search results. Therefore, we think that the first 100 video reviews will give correct results in terms of quality and reliability.

Conclusion
Producing the accurate content for informative purposes is the serious responsibility that medical doctors and professional organizations are supposed to undertake. The majority of the YouTube® videos about LE surgery were published by medical doctors. The quality and reliability of the online information made

available by YouTube® concerning LE surgery had an average level of quality and reliability. In addition, the LES scoring system created by us was found to be highly compatible with the DISCERN and JAMA scoring systems accepted in the literature and can be used as evaluation scoring in searches about lateral epicondylitis.

Conflict of Interest: The authors declare that they have no conflict of interest.
Ethical Statement: The study was conducted by the principles of the Declaration of Helsinki and with the approval of the Ordu University Training and Research Hospital Ethics Committee (decision No. 2022/30).

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