

Quality of Information in YouTube Videos on Lateral Epicondylitis

✉ Fatma Ustabaşoğlu

Edirne Sultan 1. Murat State Hospital, Clinic of Physical Medicine and Rehabilitation, Edirne, Turkey

ABSTRACT

Introduction: YouTube videos are commonly used by patients to learn more about their diseases. This study aimed to evaluate the quality of YouTube video content on lateral epicondylitis (LE).

Methods: We performed a search on YouTube using the keyword "lateral epicondylitis". The video source, video content, video duration, time since upload, number of views, comments, likes, and dislikes were recorded and evaluated. The popularity of the videos was determined using the Video Power Index (VPI). The quality and instructional value of the video were evaluated using the Global Quality Score (GQS), Lateral Epicondylitis Video Quality Score (LEVS), and DISCERN.

Results: Fifty-two of the 200 videos reviewed met the inclusion criteria. According to the video source, academic and physician videos had the highest quality, with no significant difference in DISCERN, GQS, or LEVS ($p>0.05$). VPI was significantly higher in physiotherapist videos than in academic and physician videos ($p<0.05$). The correlation between the video duration and quality score was significantly positive. The mean DISCERN, GQS, and LEVS scores for all included videos were respectively 41.7 ± 19.6 (range: 15-75), 2.8 ± 1.6 (range: 1-5), 5.7 ± 2.8 (range: 2-10), respectively, indicating moderate quality. DISCERN scores, GQS, and LEVS given to videos by 2 independent physicians were strongly correlated (respectively $r=0.963$, $r=0.918$, $r=0.914$; and $p<0.001$ for all).

Conclusion: Although the videos of academics and physicians are of high quality, their viewing rates are low. YouTube videos on LE are of moderate quality.

Keywords: YouTube videos, lateral epicondylitis, DISCERN score, quality, internet

Introduction

Lateral epicondylitis (LE), commonly referred to as tennis elbow, occurs due to injury affecting the tendons of the extensor digitorum communis and extensor carpi radialis brevis muscles at their attachment site on the bony prominence of the outer elbow (1). It is a common musculoskeletal disorder in the working population between the ages of 35 and 55 years (2). Patients typically complain of radiating pain from the lateral aspect of the elbow to the forearm, which affects most daily activities (3).

Anti-inflammatory medications, physical therapy (including activity modification, hot-cold application, rest and movement restriction, electrotherapy, massage, and ultrasound), extracorporeal shock wave therapy, splinting, laser, local injections (platelet-rich plasma and corticosteroids), and surgery have all been used to treat LE (4). In a disease with so many treatment methods, patients turn to the internet to determine what the treatments are, how they are applied, what they can do at home, or what they should pay attention to.

Digital resources and social networking platforms are assuming a growing significance in matters concerning health, becoming pivotal sources of information for numerous patients (5,6). The 2018 Health Information National Trends Survey in the United States found that over a third of patients watched health-related videos on YouTube (7). YouTube is an increasingly used video-sharing database for the acquisition of health information (5,8). It is the second most visited website worldwide, the second most popular social media network globally, a global social network translated into 80 different languages, used in 100 countries, and has more than 2 billion users (9-11). It is simple and free to upload videos to YouTube. At the same time, because there is no quality control method or peer assessment to determine the accuracy of these videos, patients may be exposed to false or misleading information. Studies on the quality and reliability of various diseases such as fibromyalgia, rheumatoid arthritis, and disk herniation have been conducted (12-14). The purpose of this study was to determine whether YouTube is a reliable and valid source of patient information about LE.



Address for Correspondence: Fatma Ustabaşoğlu MD, Edirne Sultan 1. Murat State Hospital, Clinic of Physical Medicine and Rehabilitation, Edirne, Turkey

Phone: +90 505 770 70 89 **E-mail:** fatmaustabasioglu@gmail.com **ORCID ID:** orcid.org/0000-0003-2049-3650

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Methods

This study used a register-based, cross-sectional methodology to examine YouTube searches for “lateral epicondylitis” on January 15, 2022. All video searches were performed without logging in or changing the website’s default search settings by deleting all search history. We examined the first 200 videos that came up when we searched for the given term. Videos with duplicate segments, videos under 60 seconds, videos not in English, and videos unrelated to LE were excluded.

Video source (academics, physician, physiotherapist, private clinic, health channel, personal trainer, chiropractor), video content (general information, injection, transcutaneous electrical nerve stimulation (TENS) therapy, surgical treatment technique, exercise therapy, ultrasonographic treatment, massage therapy, kinesio taping, diagnostic tests), video duration (seconds), and viewer engagement metrics such as total views, likes, dislikes, comments, and days the video was broadcast were documented for each video.

The daily count for each parameter (such as views and likes) was calculated by dividing the parameter by the total number of days the video was available for viewing. The Video Power Index (VPI) defined by Erdem and Karaca (15) was used to assess the popularity of videos using the following formula: (number of likes/number of likes + number of dislikes) 100.

The DISCERN scoring system evaluates the dependability of a publication and the quality of treatment options information provided to the patient. There are 15 questions, each of which can score 1-5 points (5= declaring that the quality standards have been reached, 2-4= declaring that the quality standards have been partly reached, 1= declaring that the quality standards have not been reached). This scoring system assesses the objectivity and exhaustibility of medical information, particularly regarding treatment. The first section contains eight questions that assess a publication’s dependability. The second section contains seven questions that assess treatment-related data (16). The DISCERN scoring system ranges from 15 to 75 points. If the study receives 63-75 points, it is considered high quality. Good quality is worth 51-62 points, fair quality is worth 39-50 points, poor quality is worth 27-38 points, and very poor quality is worth 15-26 points (17,18).

The Global Quality Score (GQS), developed by Bernard et al. (19), is a rating system used to evaluate the educational value of films meant for patient viewing. Users can use the GQS system to assess the quality of the video content. GQS considers information quality, accessibility, general information flow, and how beneficial it would be to any user (20). One point is assigned to poor quality, and five points to excellent quality.

We devised the Lateral Epicondylitis Video Quality Score (LEVS) as an evaluation metric for video quality. Scores were given as 0 to 3 points for information content of what causes LE, 0 to 4 points for information about treatment, and 0 to 3 points for knowledge of symptoms. The scores obtained in LEVS were summed to obtain a score between 0 and 10 for each video. Videos were categorized on the basis of their total scores: 0-2 points indicated very poor quality, 2-4 points denoted poor quality, 4-6 points suggested medium quality, 6-8 points signified good quality, and 8-10 points represented excellent quality.

DISCERN, GQS, and LEVS were used to assess the video content quality. Detailed information about DISCERN, GQS, and LEVS is presented in Table 1.

Two physiatrists who were blinded to each’s results assessed all the videos. First, the intraclass correlation coefficient (ICC) was calculated to measure the consistency of the scores of the two physiatrists, and an agreement power greater than 0.95 was obtained for all scoring systems. For statistical purposes, the average of the two physiatrists’ scores was used.

This study obtained ethical approval from the Trakya University Faculty of Medicine Ethics Committee (approval number: 08/20, date: 29.03.2021).

Statistical Analysis

Statistical analyses were performed using SPSS commercial software (SPSS version 20.0, SPSS, Chicago IL, USA). Means and standard deviations for normally distributed variables are presented as numerical descriptive statistics. The percentages represent descriptive statistics for categorical variables. The Kolmogorov-Smirnov test was used to assess data normality.

A t-test for independent samples was used to compare the two independent groups. The ANOVA test was performed on three independent groups using Bonferroni correction. The association between the numerical variables was determined using Pearson’s correlation test. The reliability of the two physiatrists’ scores was assessed using the ICC. The significance level was considered $p < 0.05$.

Results

Of the 200 videos, 148 were eliminated from the study for the reasons listed below: of the videos, 39 had a duration of less than 60 s, 16 were presented in a language other than English, 51 contained information about diseases other than LE, and 42 were duplicates. Most videos were posted by physiotherapists (34,6%; $n=18$), followed by physicians (25%; $n=13$), academicians (9,6%; $n=5$), chiropractors (9,6%; $n=5$), private clinics (7,7%; $n=4$), personal trainers (7,7%; $n=4$), and health channels (5,8%; $n=3$).

When we look at the video content, the most content topic is general information about the disease (30,8%; $n=16$), followed by exercise (28,9%; $n=15$). Other treatments include surgical treatment technique (11,5%; $n=6$), diagnostic tests (7,7%; $n=4$), kinesio taping (7,7%; $n=4$), massage therapy (5,8%; $n=3$), injection (3,8%; $n=2$), TENS therapy (1,9%; $n=1$), and ultrasonographic treatment (1,9%; $n=1$). The video contents according to the source are shown in Table 2.

There was a strong correlation between the DISCERN scores, GQS, and LEVS that two separate physiatrists assigned to the videos (respectively $r=0.963$, $r=0.918$, $r=0.914$; and $p < 0.001$ for all).

This study found no significant correlation between viewer interactions, VPI, and the values of the three scoring systems. The correlation between video duration and quality score was significantly positive. Table 3 shows the relationship between the video duration, user interactions, and VPI with quality. VPI was significantly higher in physiotherapist videos than in academic and physician videos ($p < 0.05$).

DISCERN Scoring System			Lateral Epicondylitis Video Quality Score System	
Question no	What is being investigated?	Question rate		
Section 1. Is the publication reliable?			0-3	Availability of information about the pathogenesis/disease mechanism of LEVS.
1	Are the aims clear?	1-5	0-3	Availability of information about symptoms and complications that may occur during LEVS.
2	Does it achieve its aims?	1-5		
3	Is it relevant?	1-5		
4	Is it clear what sources of information were used to compile the publication (other than the author or producer)	1-5	0-4	Availability of information about all treatment methods and duration of treatment for LEVS.
5	Is it clear when the information used or reported in the publication was produced?	1-5		
6	Is it balanced and unbiased?	1-5		
7	Does it provide details of additional sources of support and information?	1-5		
8	Does it refer to areas of uncertainty?	1-5		
Section 2. How good is the quality of information regarding treatment choices?			Global quality scoring system	
9	Does it describe how each treatment works?	1-5	1	Poor quality, very unlikely to be of any use to patients.
10	Does it describe the benefits of each treatment?	1-5	2	Poor quality but some information present, of very limited use to patients.
11	Does it describe the risks of each treatment?	1-5		
12	Does it describe what would happen if no treatment was used?	1-5	3	Suboptimal flow, some information covered but important topics missing, somewhat useful to patients.
13	Does it describe how treatment choices affect the overall quality of life?	1-5		
14	Is it clear that there may be more than 1 possible treatment choice?	1-5	4	Good quality and flow, most important topics covered, and useful to patients.
15	Does it provide support for shared decision making?	1-5	5	Excellent quality and flow, highly useful for patients.

LEVS: Lateral Epicondylitis Video Quality Score

Video content	Academic society, n (%)	Physician, n (%)	Physio-therapist, n (%)	Personal trainer, n (%)	Private clinic, n (%)	Health channel, n (%)	Chiropract, n (%)
General information	2 (40)	8 (61.5)	-	-	-	3 (100)	1 (20)
Exercise therapy	-	1 (7.7)	8 (44.4)	4 (100)	2 (50)	-	-
Injection	1 (20)	1 (7.7)	-	-	-	-	-
Surgical technique	2 (40)	2 (15.4)	-	-	2 (50)	-	-
Massage therapy	-	-	3 (16.7)	-	-	-	-
Kinesio taping	-	-	2 (11.1)	-	-	-	4 (80)
TENS therapy	-	-	1 (5.6)	-	-	-	-
Diagnostics tests	-	-	4 (22.2)	-	-	-	-
Ultrasonographic treatment	-	1 (7.7)	-	-	-	-	-
Total	5	13	18	4	4	3	5

The mean DISCERN score for the included videos was 41.7 19.6 (range: 15-75), indicating a moderate level of quality. Similarly, the average GQS for all videos was 2.8 1.6 (range: 1-5), indicating moderate quality. Furthermore, the mean LEVS for the videos was 5.7 2.8 (range: 2-10), indicating a moderate level of quality. Table 4 details the distribution of video distributions across scoring systems based on quality.

According to the video source, academic society and physician videos had the highest quality, with no significant difference in DISCERN, GQS, and LEVS ($p>0.05$). The quality of videos uploaded by physiotherapists,

private clinics, health channels, personal trainers, and chiropractors were significantly lower, with no statistical difference. While Table 5 shows the average values of video quality according to the video source, Table 6 shows a statistical comparison of these values.

Discussion

YouTube is a universally accessible and popular channel for health information that is free, multilingual, and easy to search. In addition, it is a visual environment with a low literacy requirement (21).

Table 3. Mean values and correlation between user interactions and video duration by quality scores

	Mean ± SD	Min.-max.	DISCERN		GQS		LEVS	
			R-value	p-value	R-value	p-value	R-value	p-value
Days the video was broadcast	1537.5±1030.7	107-4354						
Video duration	306.8±283.4	74-1834	0.529	<0.001	0.510	<0.001	0.538	<0.001
Total views	150312.9±373098.3	368-2186184	-0.023	0.870	-0.020	0.887	-0.154	0.277
Total likes	1089.3±3413.7	6-24000	0.114	0.420	0.083	0.560	0.034	0.812
Total dislikes	37.5±97.9	0-548	0.103	0.469	0.093	0.512	-0.021	0.882
Total comments	52.2±162.0	0-1137	0.164	0.245	0.136	0.336	0.088	0.535
View ratio	97.7±231.3	0.5-1268	0.031	0.828	0.044	0.757	0.012	0.931
Like ratio	95.2±4.7	78.2-100	-0.186	0.188	-0.196	0.163	-0.189	0.179
VPI	1324.6±7686.8	0.4-54831	0.027	0.848	0.041	0.775	-0.120	0.396

SD: Standard deviation, GQS: Global Quality Score, LEVS: Lateral Epicondylitis Video Quality Score, VPI: Video Power Index

Table 4. Distribution of all videos in the scoring systems according to quality

Quality	DISCERN		GQS		LEVS		Average percentage (%)
	Number of videos	Percentage (%)	Number of videos	Percentage (%)	Number of videos	Percentage (%)	
Very poor	12	23.1	12	23.1	10	19.2	21.8
Poor	11	21.2	9	17.3	12	23.1	20.5
Moderate	12	23.1	14	26.9	10	19.2	23.1
Good	8	15.4	10	19.2	9	17.3	17.3
Excellent	9	17.3	7	13.5	11	21.2	17.3

GQS: Global Quality Score, LEVS: Lateral Epicondylitis Video Quality Score

Table 5. Distribution of mean values by video unloaders in all scoring systems

Video uploader	DISCERN		GQS		LEVS	
	Mean ± SD	Range	Mean ± SD	Range	Mean ± SD	Range
Academic society	64.6±12.3	46.0-73.0	4.4±0.9	7.0-9.0	8.8±1.6	6.0-10.0
Physician	59.5±9.7	44.0-75.0	4.1±0.6	2.5-9.5	8.2±1.3	6.0-10.0
Physiotherapist	33.9±17.5	15.0-73.0	2.3±1.2	1.5-9.0	4.6±2.6	2.0-10.0
Private clinic	33.3±13.9	15.0-48.0	2.3±1.0	1.0-8.0	4.3±1.7	2.0-6.0
Chiropractor	32.8±15.5	16.0-47.0	2.2±1.1	1.0-7.0	4.4±2.2	2.0-6.0
Health channel	25.0±9.2	15.0-48.0	1.7±0.6	1.0-9.0	3.3±1.2	2.0-4.0
Personal trainer	22.5±9.0	15.0-33.0	1.5±0.6	1.0-3.0	3.0±1.2	2.0-4.0

GQS: Global Quality Score, LEVS: Lateral Epicondylitis Video Quality Score, SD: Standard deviation

Recent research has shown that Internet use is increasing among people to better understand their health problems and the treatment they receive (22,23). Therefore, although YouTube is a powerful tool for obtaining medical information, people should be careful when obtaining medical information from YouTube. Anyone from anywhere in the world can upload a video to YouTube without supervision and standardization. We know that low-quality health information obtained from YouTube negatively affects the doctor's relationship with the patient (23). Keelan et al. (24) conducted the first YouTube video study to assess the quality and reliability of medical information. Recently, articles that discuss the content, quality, and reliability of health-related videos posted on YouTube have become very popular (25,26). In this study, our primary objective was to assess the quality of YouTube videos related to LE.

In our study, 52 videos examined were viewed 150312 times on average. In a study examining 238 videos containing osteoporosis, it was reported that the mean number of views was 4719 (27). In a study evaluating 58 videos with musculoskeletal ultrasound content on YouTube, it was reported that the mean number of views was 6503 (28). The fact that the topics are different may be the reason for the difference in the number of views.

Most videos in our study were uploaded by physiotherapists. While the academics and physicians provide information about the disease and interventional procedures, the physiotherapists provide information about the exercises. The high VPI of physiotherapists reveals that patients do not want to learn what the disease is, but what exercises they can do to heal themselves at home. In addition, the fact that the

Table 6. Statistical comparison of the mean values of video unloaders in 3 scoring systems

Video source	vs	Video source	DISCERN, (p)	GQS, (p)	LEVS, (p)
Academic society	vs	Physician	>0.05	>0.05	>0.05
Academic society	vs	Physiotherapist	0.002	0.001	0.002
	vs	Private clinic	0.037	0.034	0.029
	vs	Chiropractor	0.018	0.014	0.022
	vs	Health channel	0.008	0.006	0.010
	vs	Personal trainer	0.001	0.001	0.002
Physician	vs	Physiotherapist	<0.001	<0.001	<0.001
	vs	Private clinic	0.045	0.035	0.027
	vs	Chiropractor	0.016	0.011	0.017
	vs	Health channel	0.008	0.035	0.009
	vs	Personal trainer	0.001	<0.001	0.001
Physiotherapist	vs	Private clinic	>0.05	>0.05	>0.05
	vs	Chiropractor	>0.05	>0.05	>0.05
	vs	Health channel	>0.05	>0.05	>0.05
	vs	Personal trainer	>0.05	>0.05	>0.05
Private clinic	vs	Chiropractor	>0.05	>0.05	>0.05
	vs	Health channel	>0.05	>0.05	>0.05
	vs	Personal trainer	>0.05	>0.05	>0.05
Chiropractor	vs	Health channel	>0.05	>0.05	>0.05
	vs	Personal trainer	>0.05	>0.05	>0.05
Health channel	vs	Personal trainer	>0.05	>0.05	>0.05

Statistically significant values are presented in bold. GQS: Global Quality Score, LEVS: Lateral Epicondylitis Video Quality Score

viewers are far from medical terminology may explain their preference for physiotherapists who prefer a simpler language than academics and physicians. The academic physician videos become boring and unintelligible after a while, as it becomes difficult to bring their complicated medical information to a baseline level. On the other hand, physiotherapists provide more limited medical information and show exercise examples rather than details of the disease in their videos.

When the unloaders were examined, the videos uploaded by academics and physicians had the highest quality with no significant difference in DISCERN, GQS, and LEVS. On the other hand, videos uploaded by physiotherapists had significantly lower quality. This outcome indicates that academics and physicians are reliable but not popular compared with physiotherapists. Academics and physicians should try to upload educational videos with high popularity to have a better impact on society, and the long-term effects of this should be investigated with more comprehensive studies. Information on the internet is really valuable because it is difficult for people to reach hospitals, they cannot spare time for examination, and some diseases can only be cured with exercise. Unfortunately, since the information uploaded to the internet has not been audited, it is not right to trust it completely. Therefore, when searching for health-related information on the internet, attention should be paid to the source of the information.

This is the third study on LE YouTube videos in the English literature. The first research was published by Karagoz et al. (29), and the second was published by Özcan and Gürçay (30). The first study found no significant correlation between video source and DISCERN and GQS scores, whereas

we and Özcan and Gürçay (30) found that the videos uploaded by physicians and academics have the highest quality. Although they found that YouTube videos on LE do not provide moderately sufficient information, we found that they provide moderate quality. The results were incompatible among the three studies, despite the identical topic. Because the content on YouTube changes so quickly, the videos on the first pages are constantly changing. These two studies were conducted at different times; therefore, the videos watched are probably different. This shows that if research on YouTube videos is performed at different times, the results will be different because the videos watched also change.

Study Limitations

This study has some limitations that should be considered. The first limitation of this study is that YouTube has a very dynamic structure. Content is constantly changing. According to the search date and time, the results can change. The fact that the GQS is an extremely subjective scoring is the second limitation of our study, and we aimed to eliminate this subjectivity by performing each assessment twice by two separate authors. The third limitation, in order of popularity was included the top 52 videos on YouTube for "lateral epicondylitis." This search approach missed several videos that had a small number of views but could be of great 5-quality.

Conclusion

Our study showed that YouTube videos on LE have moderate quality. Video quality is significantly associated with the upload source. Health-

related videos should be verified before they are uploaded to ensure that viewers have access to the correct information they need about health. Therefore, health-related content must be uploaded by experts. To achieve this, new studies should be conducted to prepare appropriate software.

Ethics Committee Approval: This study obtained ethical approval from the Trakya University Faculty of Medicine Ethics Committee (approval number: 08/20, date: 29.03.2021).

Informed Consent: Informed consent was obtained from all individual participants included in the study.

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