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Original Article

Assessment of the Quality and Reliability of YouTube Videos on Fuchs Endothelial Corneal Dystrophy

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Abstract

Objectives: The aim of the study was to assess the quality and reliability of videos on Fuchs endothelial corneal dystrophy (FECD) on YouTube.

Methods: A search of YouTube was performed for the term "FECD" without any changes to the website's standard search preferences. The first 100 videos were recorded. A total of 71 videos were evaluated regarding the DISCERN score (min–max: 16–75), Journal of the American Medical Association (JAMA) score (min–max: 0–4), and Global Quality Scale (GQS) score (min–max: 0–5).

Results: The mean DISCERN score was 40.1±15.6 (moderate), the mean JAMA score was 2.01±0.7 (poor), the mean GQS score was 2.5±1.3 (moderate), and the mean video power index score was 106.8±135.7. Twenty-three of the videos (32.4%) were uploaded by physicians, 25 (35.2%) by universities/private hospitals, and 21 (29.6%) by health channels. Thirty-six videos (50.7%) contained information about the disease, 24 (33.8%) discussed surgical techniques, and 11 (15.5%) were about patient experience.

Conclusion: YouTube provides only moderate-quality health information on FECD. Physicians and professional organizations should be aware of and embrace this evolving technology to raise awareness about FECD.

Keywords: DISCERN score, Fuchs endothelial corneal dystrophy, Global Quality Scale score, Journal of the American Medical Association score, YouTube

Introduction

The internet has evolved into a common information source, and 80% of users consult web sources for health information (1). YouTube (www.youtube.com), which provides video sharing over the internet free of charge, is leading the way in information sharing (2). Videos allow for the demonstration of difficult concepts using simulation, diagrams, dynamic illustrations, and real patients. Although anyone can access information through YouTube, it may not be possible for everyone to judge the quality, reliability, and accuracy of that information. Biased or inaccurate information can have a negative effect on communication and the trust bond between a physician and patient, especially when it comes to discussing treatment options (3).

Fuchs endothelial corneal dystrophy (FECD) is a bilateral disease of the corneal endothelium characterized by the accelerated loss of corneal endothelial cells with changes in the Descemet membrane (DM), including the

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accumulation of the extracellular matrix and formation of the posterior focal excrescences, called guttae. Loss of vision from FECD can result from these DM changes as well as later stage disruption of corneal endothelial pump-leak function causing corneal edema, bullae formation, and subepithelial fibrosis (4). Medical therapy for FECD-related vision loss is limited to decreasing corneal edema with topical hyperosmotic drops and ointment. The management of FECD has dramatically evolved over the past 20 years. At present, corneal transplantation represents the only definite treatment option, and FECD is the most common cause of corneal transplantation worldwide (5,6). The current preferred surgical management of FECD is endothelial keratoplasty (EK), which has shown excellent rates of corneal clearance. With EK, the risk of surgical intervention including graft rejection, prolonged visual rehabilitation, infection, and post-operative astigmatism has decreased significantly. Patients can now undergo transplantation earlier in the disease course, guided by visual symptoms and clinical findings (7).

In the literature, the quality and reliability of online videos have been investigated for different health-care disciplines. However, to the best of our knowledge, no previous study has evaluated YouTube videos on FECD. Thus, the aim of our study was to assess the quality, reliability, and popularity of YouTube videos on FECD.

Methods

This study did not require Institutional Review Board approval. A search was performed on YouTube® (http://www. youtube.com) on July 16, 2021, using the keyword "FECD.." The top 100 videos were selected for the review, as determined by "relevance" according to YouTube's algorithm. Video searches were performed without any user login after clearing the entire search history of the browser. Videos presented in non-English language, those without sound, those shorter than 60 s, those that were not related to FECD, and duplicate videos were excluded from the study.

For each video included in the study, the title, number of views, video length, time since upload (age), number of likes, number of dislikes, and number of comments were recorded, and the like ratio, view ratio, and video power index (VPI) were calculated. To assess the popularity of the videos, VPI and the view ratio were used. The view ratio was calculated by dividing the number of views by the time since upload. The like ratio was calculated as follows: Number of likes × 100/(number of likes + number of dislikes). To calculate VPI, the method described by Erdem et al. was used: Like ratio × view ratio/100.

The videos were also categorized into four groups according to their upload source: Physicians, universities/private hospitals, health channels, and independent users. Categories classified according to content were (1) information about disease, (2) surgical technique, and (3) patient experience.

The quality of information presented in each video was assessed using the DISCERN score and the Journal of the American Medical Association (JAMA) benchmark. The DISCERN questionnaire consists of three sections including 16 questions, and a higher score indicates better quality. The first eight questions are related to reliability, and the next seven questions evaluate the specific details of treatments received. The last question addresses the overall quality of a publication. In the present study, according to the DISCERN scoring system, the videos were grouped into excellent quality (63–75 points), good quality (51–62 points), fair quality (39–50 points), poor quality (27–38 points), and very poor quality (16–26 points).

The JAMA benchmark evaluates the quality of online information based on four criteria: Authorship, attribution, disclosure, and currency. One point is given for each criterion, and the highest quality is indicated by 4 points.

The Global Quality Scale (GQS) was used to assess each video in terms of its instructive aspects for patients. The GQS system allows users to evaluate the overall quality of a video's content on a 5-point Likert scale. While a score of 1 point indicates poorest quality, a score of 5 points indicates excellent quality.

Each video was independently analyzed by two experienced surgeons, and the obtained data were recorded. The reproducibility of the DISCERN, JAMA, and GQS scores was tested before the primary analysis, and the interobserver intraclass correlation coefficients revealed a Spearman correlation coefficient of greater than 0.90. The differences in the mean values of the scores between the observers were statistically analyzed.

Statistical Analysis

The data obtained were analyzed using SPSS v. 16.0 (SPSS Inc., Chicago, IL, USA). Data distribution was tested using the Shapiro–Wilk test. The Kruskal–Wallis test was used to compare the parameters between the groups. The Tamhane test was used as a post hoc method. The correlation statistics were obtained using the Spearman test. $P<0.05$ was considered statistically significant.

Results

A total of 100 videos were initially selected. After excluding videos that were not related to FECD (n=6), duplicate videos (n=6), videos shorter than 60 s (n=7), those without sound (n=7), those presented in any language other than

English (n=1), and those that could not be opened (n=2), 71 videos were included in the sample. Table 1 summarizes the descriptive statistics of the videos.

Twenty-three of the videos (32.4%) were uploaded by physicians, 25 (35.2%) by universities/private hospitals, 21 (29.6%) by health channels, and two by independent users (2.8%). Thirty-six videos (50.7%) contained information about the disease, 24 (33.8%) discussed surgical techniques, and 11 (15.5%) were about patient experience.

Table 1. Descriptive statistics of the evaluated videos

Descriptive statistics	Mean±SD	Range
View count (n)	3242.54±4845.22	15–34.084
Length (min)	13.7±18.9	0.5–65
Age (d)	44.1±37.7	1–139
Likes (n)	33.1±38.8	0–196
Dislikes (n)	1±1.3	0–5
Comments (n)	2.61±6.1	0–47
DISCERN score	40.1±15.6	16–80
JAMA score	2.01±0.7	1–4
GQS score	2.5±1.3	1–5
Like ratio	95.3±9.6	50–100
View ratio	105.8±138.2	0.2–603
VPI	106.8±135.7	0.2–597

SD: Standard deviation; VPI: Video power index; JAMA: Journal of the American Medical Association; GQS: Global Quality Scale.

The mean DISCERN score was 40.1±15.6, the mean JAMA score was 2.01±0.7, the mean GQS score was 2.5±1.3, and the mean VPI was 106.8±135.7. When we evaluated the videos according to the upload source, there was no significant difference in the DISCERN, JAMA, GQS, and VPI scores (p=0.18, p=0.52, p=0.68, and p=0.76, respectively) (Table 2).

However, the DISCERN, JAMA, and GQS scores statistically significantly differed according to video content (p=0.032, p=0.000, and p=0.002, respectively) (Table 3). There was a significant difference between the videos on patient experience and those on surgical techniques in relation to the DISCERN score (p=0.014). While there was no significant difference in the JAMA scores of the videos providing information about the disease and those discussing surgical techniques, the videos about patient experience had a significantly different JAMA score compared to the other two video content groups (p=0.00 for both). A significant difference was also observed between the videos on patient experience and those on surgical techniques in terms of the GQS scores (p=0.002). Finally, VPI statistically significantly differed between the videos on patient experience and those providing information about the disease (p=0.017).

The DISCERN, JAMA, and GQS scores showed significant correlations with each other. These scores were also correlated with video length, but they were not correlated with age, number of likes, number of dislikes, or number of comments (Table 4).

Table 2. Comparison of the DISCERN score, JAMA score, GQS score, and VPI according to the video upload source

	Physicians	Universities/private hospitals	Health channels	Independent users	P
DISCERN score	40.3±14.7	37±14.3	44.8±17.1	37±29.6	0.18
JAMA score	2.1±0.46	1.91±0.9	2.04±0.8		0.52
GQS score	2.7±1.2	2.3±1.1	2.7±1.5	2±1.4	0.68
VPI	126±141	84.1±124.7	103.3±136.4	192.9±257.6	0.76

VPI: Video power index; JAMA: Journal of the American Medical Association; GQS: Global Quality Scale.

Table 3. Comparison of the DISCERN score, JAMA score, GQS score, and VPI according to video content

	Information about disease	Surgical technique	Patient experience	P*
DISCERN score	40.2±15.1	45±16.3	30.6±15.2	0.032*
JAMA score	2.17±0.67	2.16±0.7	1.2±0.4	0.000*
GQS score	2.38±1.27	3.16±1.2	1.7±1.05	0.002*
VPI	138.9±173.4	88.3±77.05	42.1±45.8	0.25

*P<0.05; VPI: Video power index; JAMA: Journal of the American Medical Association; GQS: Global Quality Scale.

Table 4. Correlation between the DISCERN score, JAMA score, GQS score, VPI, and video parameters

	DISCERN score	JAMA score	GQS score	VPI score	View ratio	Age	Likes	Dislikes	Comments	Length
DISCERN score		r=0.357*	r=0.803*	r=0.114	r=0.119	r=-0.1	r=0.056	r=0.002	r=-0.019	r=0.346*
		P=0.002*	P=0.000*	P=0.355	P=0.323	P=0.408	P=0.645	P=0.984	P=0.872	P=0.03*
JAMA score	r=0.357*		r=0.444*	r=0.017	r=0.001	r=-0.145	r=0.067	r=-0.070	r=0.003	r=0.551*
	P=0.002*		P=0.000*	P=0.888	P=0.992	P=0.228	P=0.579	P=0.561	P=0.977	P=0.000*
GQS score	r=0.803*	r=0.444*		r=0.173	r=0.212	r=-0.018	r=0.154	r=0.081	r=0.137	r=0.399*
	P=0.000*	P=0.000*		P=0.159	P=0.075	P=0.882	P=0.201	P=0.500	P=0.254	P=0.001*
VPI	r=0.114	r=-0.017	r=0.173		r=0.995*	r=-0.196	r=0.748*	r=0.418*	r=0.430*	r=0.195
	P=0.355	P=0.888	P=0.159		P=0.000*	P=0.109	P=0.000*	P=0.000*	P=0.000*	P=0.111
View ratio	r=0.119	r=0.001	r=0.212	r=0.995*		r=-0.194	r=0.764*	r=0.478*	r=0.458*	r=0.189
	P=0.323	P=0.992	P=0.075	P=0.000*		P=0.105	P=0.000*	P=0.000*	P=0.000*	P=0.114
Age	r=-0.1	r=-0.145	r=-0.018	r=-0.196	r=-0.194		r=0.208	r=0.195	r=0.209	r=-0.319*
	P=0.408	P=0.228	P=0.882	P=0.109	P=0.105		P=0.082	P=0.104	P=0.08	P=0.007*
Likes	r=0.056	r=0.067	r=0.154	r=0.748*	r=0.764*	r=0.208		r=0.632*	r=0.673*	r=0.164
	P=0.645	P=0.579	P=0.201	P=0.000*	P=0.000*	P=0.082		P=0.000*	P=0.000*	P=0.173
Dislikes	r=0.002	r=-0.070	r=0.081	r=0.418*	r=0.478*	r=0.195	r=0.632*		r=0.366*	r=-0.03
	P=0.984	P=0.561	P=0.500	P=0.000*	P=0.000*	P=0.104	P=0.000*		P=0.002*	P=0.802
Comments	r=-0.019	r=0.003	r=0.137	r=0.430*	r=0.458*	r=0.209	r=0.673*	r=0.366		r=0.099
	P=0.872	P=0.977	P=0.254	P=0.000*	P=0.000*	P=0.08	P=0.000*	* P=0.002*		P=0.414

*P<0.05; VPI: Video power index; JAMA: Journal of the American Medical Association; GQS: Global Quality Scale.

Discussion

Patients who want to take a more active role in decision-making about their treatment are increasingly using the internet to seek information about their disease (8). Achieving the right information from reliable sources increases patient satisfaction and can improve treatment results (9-11). However, in our assessment of the quality of information presented in YouTube videos on FECD, we found that these videos provided only moderate-quality information about the disease.

Similar to our study, studies evaluating YouTube videos in the literature have reported that video content was generally of poor-moderate quality. In a YouTube study related to strabismus, Mangan et al. reported the mean DISCERN, JAMA, and GQS scores as 42.2±15.3, 1.9±1.2, and 2.7±1.1, respectively, and concluded that these videos provided only moderate-quality information about strabismus (3). In a study by Küçük et al., in which YouTube videos were evaluated as an educational resource in refractive surgery, the DISCERN, JAMA, and GQS scores were determined to be 33.25±15.34 (poor), 0.74±0.82, and 1.74±0.81, respectively, and the authors reported that YouTube videos did not adequately inform patients about surgical procedures (12). Sahin et al. found that 64% of YouTube videos on retinopathy of prematurity were useful, Gutrie et al. reported that 32% of videos on retinitis pigmentosa were useful, and Hickman et al. observed that only 23% of videos on neurological eye movements were of excellent quality (13-15).

In our study, no significant difference was found between the video upload sources in terms of the DISCERN, JAMA benchmark, GQS, and VPI scores. Unlike other studies, there were no patient-uploaded videos, and independent users had posted only 2.8% of the evaluated videos (3). Many studies have shown that the quality and reliability of videos uploaded by physicians are higher than those uploaded by non-physicians, but the former have a lower viewing rate (16). In our study, no difference was found between the video sources in terms of the number of views.

When evaluated according to video content, there was no difference between the videos providing information about the disease and those discussing surgical techniques in terms of the DISCERN, JAMA, GQS, and VPI values. In the videos presenting patient experience, the DISCERN, JAMA, and GQS scores were lower compared to the videos discussing surgical techniques and VPI was lower than two groups. Unlike other studies, the popularity of the videos on patient experience was found to be lower (3,17,18). In these

videos, it is not possible to distinguish whether the patients describe their own experience and thoughts or they share this information for a fee for advertisement purposes. Our findings indicate that patients prefer more informative, accurate, and reliable sources about FECD.

In our study, we did not separate the videos as useful or misleading, but there was no inaccurate, misleading, or non-evidence-based information in the FECD-related videos. One reason for the low DISCERN, JAMA, and GQS scores is that these parameters alone may not actually be sufficient to evaluate YouTube videos. The DISCERN questionnaire was developed in recognition of the need for a general set of quality criteria for written consumer health information (19). The JAMA benchmark was also created to assess online sources for the delivery of medical information (20). Videos differ from web pages in several aspects. First, most videos focus on a single topic, such as genetics, symptoms, diagnostic methods, and treatment techniques rather than covering all aspects of the disease, and therefore, they receive low scores in quality and reliability evaluations. Second, YouTube videos do not mention references or sources used for content, they do not declare the presence of any conflict of interest, and they are not regularly updated in contrast to online websites.

There are some limitations to the present study. The primary limitation of our study was analyzing only the first 100 videos on YouTube on searching the keyword "FECD." A single time point was used to assess the quality of the videos, but search results may vary over time. In addition, the present study investigated only the videos in English language. Although this makes it hard to generalize the results of the study, English is accepted as the prevailing language among internet users. Finally, we did not use a form to record the evaluated parameters for the FECD-related videos.

Conclusion

This was the first study to investigate the quality of FECD videos on a popular video sharing site. The quality of information in YouTube videos on FECD was determined to be moderate. There was no difference in the quality and reliability of the videos according to the upload source or video content except patient experience. Ensuring that there are more videos providing health-care information created by health-care professionals and refined by a professional review process can increase public health awareness, and the internet can be a useful tool for delivering this high quality and reliable information to the public.

Disclosures

Peer-review: Externally peer-reviewed.

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