

# YouTube as a source of information on vertigo for patients

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January 31, 2024

## Abstract

**Abstract Objective:** YouTube is one of the most visited social media websites in the world with a huge database. It is used frequently for information on diseases and symptoms. The purpose of this study is to analyze the content and reliability of the content of videos about vertigo on YouTube. **Methods:** A search was made on youtube using the keyword “vertigo”. After the exclusion of 81 videos, the remaining 69 videos were analyzed by two independent reviewers. Video demographics, content of videos, quality of content and reliability of information were evaluated using total content scoring (TCS), Global Quality Scale (GQS) and modified DISCERN for each video. A 9-point scale was used to assess the content of videos and the videos were classified as high- and low-content according to this scale. **Results:** Fourty six (66.7%) of the videos were included in the low-content group, while 23 (33.3%) were included in the high-content group. The mean TCS, GQS and modified DISCERN scores of the videos were 3.42, 2.48 and 2.09, respectively. There were significant positive correlations between GQS and total content score ( $r=0.873$ ,  $p<0.001$ ), between modified DISCERN and total content score ( $r=0.883$ ,  $p<0.001$ ) and between modified DISCERN and GQS ( $r=0.900$ ,  $p<0.001$ ). **Conclusion:** The results of this study show that the videos about vertigo currently featured on YouTube do not contain enough informational content. Most of the videos focus on maneuvers, and diagnosed patients may be advised to watch certain videos to learn how to perform the maneuvers.

## Introduction

Vertigo is generally defined as the sensation of self or environmental motion [1]. Patients and many physicians tend to use the terms dizziness and vertigo interchangeably, however, dizziness is divided into subgroups and vertigo constitutes approximately 54% of cases of dizziness [2, 3]. It is estimated that approximately 20-30% of the general population has vertigo symptoms during their lifetime, and the annual prevalence is around 4.9% [1]. Vertigo occurs as a result of dysfunction at any level of the vestibular system and is classified as peripheral and central according to the level of this dysfunction. The most common diseases causing vertigo are benign paroxysmal positional vertigo, vestibular neuronitis and Meniere’s disease. Although the most common causes of vertigo are usually benign, vertigo may occur in more serious cases such as cerebrovascular accidents, multiple sclerosis and tumors [3].

With the development and spread of the internet and social media, health information is now more accessible to patients [4]. In a survey conducted in United Kingdom, it was stated that 73% of internet users had looked up health information online at least once [5]. 75% of patients with chronic illnesses in the US stated that information obtained online affected their decision-making process [5]. However, considering that not every information on the internet is added by experts and that there may be false information, patients are likely to be affected by this information both positively and negatively.

YouTube is a free video broadcast platform, and it has become the second most visited website in the world with billions of views daily and over 2 billion viewers per month [6, 7]. YouTube is a huge platform where videos about almost everything can be found. These videos include medical information uploaded by experts as well as their own treatment experiences uploaded by patients. As the use of YouTube has become popular

in medicine, the quality of YouTube content has been assessed in several studies [8-10]. These studies' results are important in terms of revealing the level of information that patients acquire about a particular subject.

To our knowledge, this is the first study that evaluates the content of YouTube videos on vertigo. In this study, we aimed to analyze the content and quality of YouTube videos related to vertigo, which is so common and can sometimes be a harbinger of serious diseases.

## Methods

### *Youtube search*

"Google Trends" is an online search tool that allows us to learn the most commonly searched specific keywords, phrases or topics in a certain time period in a particular region or whole world. Google Trends' search filter has been set to "past 5 years" and "worldwide" for more comprehensive search results. Then, the most commonly used words on this subject by both patients and physicians, "vertigo" and "dizziness", were compared on December 27, 2020. In the comparison, it was found that the word "vertigo" is used more frequently.

After the history and cookies of the used Web Browser were deleted, on December 27, 2020, the keyword "vertigo" was searched on YouTube using the "sort by relevance" filter. The first 150 videos were selected for further review and the links of the videos were saved.

### *Selection of videos*

The selected 150 videos were reviewed to determine how many of them could be included in the study. Duplicate videos, irrelevant videos, videos not in English, conference and meeting videos, videos with no sound and videos that were longer than 30 minutes were excluded from the study. After the exclusion, 69 videos remained for further analysis.

### *Assessment of videos*

All videos were viewed and evaluated by 2 reviewers (O.Ü. and E.Ç.) independently. In case of disagreement in scoring and analysis among reviewers, a consensus meeting was held, and a joint decision was reached. The number of views, number of likes and dislikes, total video duration (in seconds), date of upload and number of comments were recorded for the determination of descriptive data. Viewer interactions were calculated with the interaction index ( $[\text{number of likes} - \text{number of dislikes}] / \text{total number of views} * 100\%$ ), viewing rate ( $\text{number of views} / \text{number of days since upload} * 100\%$ ) and video power index ( $[\text{number of likes} + \text{number of dislikes}] * 100\%$ ) formulas [11, 12].

We categorized all videos as healthcare professionals, hospital/university, commercial, layperson or other according to the source of upload. We also categorized the type of videos as educational (videos aimed to provide educational information about vertigo) or testimonial (videos containing personal experiences about vertigo).

The videos were evaluated according to their informational content on the following 9 items: (1) definition of vertigo; (2) etiology or pathophysiology of vertigo; (3) symptoms; (4) types of vertigo; (5) diagnosis; (6) maneuvers; (7) treatment; (8) alarm symptoms; and (9) prognosis. Each item was given 1 point and the total content score of a video was calculated to be a maximum of 9 points as the sum of these 9 items. Videos with a total content score of 0-4 points were defined as low content, while those with a score of 5-9 points were defined as high content. We used the Global Quality Scale (GQS), a validated quality measurement scale, to assess the quality of the videos. GQS is a 5-point Likert scale used to measure the overall quality of the information and how useful the videos would be to the patients, with 5 representing excellent quality (very useful for patients) and 1 representing poor quality (most information missing, not useful for patients) [13]. In addition, the reliability of information was assessed using the modified DISCERN tool, which is a 5-item questionnaire, with a possible score range of 0-5 points (higher scores indicating higher reliability) [14].

This study did not require approval by the ethics committee since it was used only publicly available data.

## Statistical analysis

SPSS 15.0 for Windows was used for statistical analysis. Descriptive statistics were given as numbers and percentages for categorical variables, and as median and interquartile range for numeric variables. The rates in independent groups were compared using the Chi-Square Test. When the numerical variable did not meet the normal distribution condition, comparisons of two independent groups were made using the Mann Whitney U Test. Relationships between numerical variables were analyzed using Spearman Correlation Analysis. Statistical significance level of alpha was accepted as  $p < 0.05$ .

## Results

Eighty one of the 150 videos were excluded from the study due to exclusion criteria, and the remaining 69 videos were analyzed.

The descriptive statistics of the YouTube videos are presented in Table 1. The mean number of views for the videos on vertigo was 747,452.4 (min – max: 1,944 – 7,959,884, median: 166,229). The mean length of the videos was 357.2 seconds (min – max: 79 – 1,764 seconds, median: 266 seconds). The average number of days since the videos were uploaded was 1,447.1 days (min – max: 220 – 4,218 days, median: 1,288 days). The mean viewing rate of the videos was 44,928.2 (min – max: 153.7 – 348,506.3, median: 16,737.8). While the overall mean number of likes of the videos was 4,608.3 (min – max: 10 – 35,060, median: 1,698.5), the average number of dislikes was 222.7 (min – max: 1 – 1,772, median: 62). The mean number of comments made to the videos was 359.6 (min – max: 0 – 2,656, median: 137). The mean interaction index was 0.88 (min – max: 0.05 – 2.79, median: 0.73), while the mean video power index was 94.6 (min – max: 81 – 99.7, median: 95.6). The average number of views per day of the videos was 449.3 (min – max: 1.5 – 3,485.1, median: 167.4).

The mean total content score, GQS and modified DISCERN scores of the videos were 3.42 (min – max: 0 – 8), 2.48 (min – max: 1 – 5) and 2.09 (min – max: 0 – 5), respectively (Table 1).

It was seen that most of the videos were uploaded by healthcare professionals ( $n = 25$ , 36.2%), followed by other ( $n = 19$ , 27.5%), hospital / university ( $n = 18$ , 26.1%), commercial ( $n = 4$ , 5.8%) and layperson ( $n = 3$ , 4.3%). It was found that most of them were educational videos ( $n = 63$ , 91.3%), meaning videos that give information about vertigo, while a small part was testimonial videos ( $n = 6$ , 8.7%), meaning videos where people share their personal experiences (Table 2).

66.7% ( $n = 46$ ) of the videos were included in the low content group, while 33.3% ( $n = 23$ ) were included in the high content group (Table 3). The differences in sources of upload and video type between the high and low content videos were not statistically significant ( $p = 0.122$ ,  $p = 0.168$ ) (Table 3). Among the items used in content scoring, the most mentioned items in the videos were maneuvers ( $n = 47$ , 68.1%), treatment ( $n = 37$ , 53.6%), and symptoms ( $n = 38$ , 55.1%), respectively, while the least mentioned items were alarm symptoms ( $n = 6$ , 8.7%), prognosis ( $n = 8$ , 11.6%), and types of vertigo ( $n = 17$ , 24.6%), respectively.

In Table 4, high and low content videos are compared according to video characteristics and no significant difference was found between the two groups in terms of video characteristics ( $p > 0.05$ ). GQS was found significantly higher in high content videos than low content videos ( $p < 0.001$ ). Modified DISCERN was found significantly higher in high content videos than low content videos ( $p < 0.001$ ) (Table 4).

In Table 5, educational and testimonial videos are compared according to video characteristics and no significant difference was found between the two groups ( $p > 0.05$ ).

Spearman's correlation analysis showed that significant positive correlations were found between GQS and total content score ( $r = 0.873$ ,  $p < 0.001$ ), between modified DISCERN and total content score ( $r = 0.883$ ,  $p < 0.001$ ) and between modified DISCERN and GQS ( $r = 0.900$ ,  $p < 0.001$ ) (Table 6). There was no statistically significant relationship between total content score and video demographics ( $p > 0.05$ ). There was no statistically significant relationship between GQS and video demographics ( $p > 0.05$ ). There was no statistically significant relationship between modified DISCERN and video demographics ( $p > 0.05$ ) (Table 6).

## Discussion

There has been a strong increase in access to health-related information on YouTube due to free access and ease of use [15]. There is no system that checks the quality of the videos or the accuracy of the information in the videos during uploading. Although social media, especially YouTube, is very beneficial for both patients and healthcare professionals, who use it to educate themselves, these platforms carry risks such as the availability of incorrect, uncontrolled and incomplete information [16]; therefore, in order to improve the content of YouTube videos related to health, video sources should be checked and the videos should be evaluated for the accuracy of the information they contain [17, 18]. In the present study, we wanted to examine the content and quality of the content of videos about vertigo on YouTube. There are many studies in the literature that examine videos on YouTube about various diseases and treatments [8-10, 18]. To our knowledge, this was the first study that objectively evaluates the quality and reliability of information about “vertigo” on YouTube.

When we examined the videos about vertigo, we observed that most of the videos consisted of videos containing general information about vertigo and videos showing how to do the maneuvers. Kerber et al. analyzed YouTube videos on the Epley maneuver and reported that 64% of the videos were accurately demonstrated Epley maneuver [19]. Our view on this is that if a physician directs the patient to YouTube videos after telling the patient what maneuver to do after making the diagnosis, it will be very helpful. However, it should be kept in mind that if patients turn to these videos before they are fully diagnosed, their symptoms may worsen.

When we examined the videos according to their content, we observed that the majority of the videos (66.7%) had low content although most of the videos were uploaded by healthcare professionals (36.2%). Correlation of the content scoring with GQS and modified DISCERN shows us that the content scoring we have made is consistent. Most of the previous studies, except for a small part [20, 21], showed that health-related videos on YouTube had low content, in line with our study [8, 22, 23].

While previous studies revealed a positive correlation between the duration of the videos and the information content, no such correlation was observed in the present study [8, 12, 24]. Paksoy et al. found a positive correlation between the total content score and video duration but did not find a correlation between the total content score and the number of comments, likes, dislikes, interaction index and viewing rate [17]. In our own study, we did not find a correlation between the total content score and the number of comments, likes and dislikes, interaction index and viewing rate, and unlike the study of Paksoy et al., we did not find any correlation between total content score and video duration.

When high content and low content videos were compared, no significant difference was found in terms of video length, number of views, number of comments, likes and dislikes, interaction index, power index and viewing rate. This shows us that low content videos are watched as much as high content videos. Previous studies present various results about this and there is no correlation between publications. For example, the results of the study conducted by Paksoy et al. are similar to ours [17]. In the study of Üstün et al. [8], the results were similar to ours, but unlike our study, they found a significant difference between high and low content videos in terms of video duration.

The videos uploaded by the laypersons are all testimonial videos in which they convey their personal experiences. When all testimonial videos were compared with educational videos in terms of video characteristics, we found that there was no significant difference between the 2 groups. In other words, vertigo searchers are curious about the experiences of the people as well as the educational information.

The study has several limitations. We used Google Trends to find the most commonly used keyword in this regard, but when searching on YouTube with a different keyword, different results may be obtained. The results are likely to vary constantly, as the data on YouTube changes with every passing moment. There is a shortage of videos available in other languages, as only videos in English are reviewed. There was no validated assessment tool to examine the content of the videos. For this reason, a content score scheme was created jointly by two authors of the present study, taking inspiration from previous studies, and examinations were

made accordingly.

## Conclusion

YouTube offers a wide range of content for all kinds of information. However, there is no mechanism to check the accuracy or adequacy of these contents. In our study, we found that most of the videos about vertigo have low content. Since such a large and popular social media platform is unlikely to be audited, physicians and universities must establish a higher content standard by sourcing, especially for health-related issues to contribute to improving YouTube content quality over the long term.

## Declaration

*Funding* : None.

*Conflicts of interest* : The authors have no conflict of interest.

*Ethical approval* : Not required.

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## Tables

Table 1. Descriptive statistics of the videos

Variables	Minimum	Maximum	Mean	Std. Dev.	Median
<b>Video characteristics</b>					
Number of views	1944	7959884	747452,4	1392506,9	166229
Duration in seconds	79	1764	357,2	311,4	266
Days since upload	220	4218	1447,1	935,1	1288
Number of comments	0	2656	359,6	526,6	137
Number of likes	10	35060	4608,3	7149,0	1698,5
Number of dislikes	1	1772	222,7	344,4	62
Interaction index	0,05	2,79	0,88	0,60	0,73
Viewing rate	153,7	348506,3	44928,2	65948,5	16737,8
Number of daily views	1,5	3485,1	449,3	659,5	167,4
Video Power	81,0	99,7	94,6	3,5	95,6
<b>Total Content Score</b>	0	8	3,42	2,40	3
<b>Global Quality Score</b>	1	5	2,48	1,15	2
<b>Modified DISCERN</b>	0	5	2,09	1,31	2

Table 2. Number of videos according to source of upload and video type

	Total (n, (%))	Educational (n, (%))	Testimonial (n, (%))
<b>Source of Upload</b>			

	Total (n, (%))	Educational (n, (%))	Testimonial (n, (%))
Healthcare Professionals	25 (36,2%)	25 (39,7%)	0 (0,0%)
Commercial	4 (5,8%)	3 (4,8%)	1 (16,7%)
Hospital/University	18 (26,1%)	18 (26,1%)	0 (0,0%)
Layperson	3 (4,3%)	0 (0,0%)	3 (50,0%)
Other	19 (27,5%)	17 (27,0%)	2 (33,3%)
<b>Video Type</b>			
Educational	63 (91,3%)		
Testimonial	6 (8,7%)		

Table 3. Distribution of YouTube video demography in high and low content video groups

	Total Content Score	Total Content Score	p
	Low (n=46) (66,7%)	High (n=23) (33,3%)	
<b>Source of Upload</b>			0,122
Healthcare professionals	19 (41,3%)	6 (26,1%)	
Commercial	11 (23,9%)	7 (30,4%)	
Hospital/University	4 (8,7%)	0 (0,0%)	
Layperson	3 (6,5%)	0 (0,0%)	
Other	9 (19,6%)	10 (43,5%)	
<b>Video Type</b>			0,168
Educational	40 (87,0%)	23 (100%)	
Testimonial	6 (13,0%)	0 (0,0%)	
<b>Content</b>			
Definition	8 (17,4%)	22 (95,7%)	<0,001*
Etiology/Pathophysiology	11 (23,9%)	21 (91,3%)	<0,001*
Symptoms	16 (34,8%)	22 (95,7%)	<0,001*
Types of vertigo	5 (10,9%)	12 (52,2%)	<0,001*
Diagnosis	7 (15,2%)	14 (60,9%)	<0,001*
Maneuvers	25 (54,3%)	22 (95,7%)	0,001*
Treatment	17 (37,8%)	20 (87,0%)	<0,001*
Alarm symptoms	1 (2,2%)	5 (21,7%)	0,014*
Prognosis	2 (4,3%)	6 (26,1%)	0,014*

\*p< 0.05

Table 4. Comparison of Variables Between High and Low Content Videos

Variables	Total Content Score	Total Content Score	Total Content Score	Total Content Score	P
	Low Content	Low Content	High Content	High Content	
	Mean±SD	Median	Mean±SD	Median	
<b>Video characteristics</b>					
Number of views	878527,0±1512633,6	171005,5	485303,2±1098004,4	101766	0,186
Duration in seconds	288,4±181,4	240,5	494,9±450,2	320	0,156
Days since upload	1510,5±981,7	1316	1320,5±840,6	1111	0,500
Number of comments	347,2±507,9	137	382,3±570,7	177	0,763
Number of likes	4983,4±6985,1	2059	3907,0±7553,9	1240	0,203
Number of dislikes	255,4±368,7	80	161,5±291,4	45	0,170
Interaction index	0,87±0,58	0,74	0,92±0,63	0,63	0,772

Variables	Total Content Score	Total Content Score	Total Content Score	Total Content Score	P
Viewing rate	50617,6±72124,4	17521,3	33549,5±50986,5	16737,8	0,373
Number of daily views	506,2±721,2	175,2	335,5±509,9	167,4	0,373
Video Power	94,3±4,0	95,7	95,0±2,5	95,1	0,747
<b>Global Quality Score</b>	1,91±0,69	2	3,61±1,03	3	<0,0
<b>Modified DISCERN</b>	1,46±0,98	2	3,35±0,93	3	<0,0

\*p<0.05

Table 5. Comparison of variables between educational and testimonial videos

Variables	P				
	<b>Educational</b> Mean±SD	<b>Educational</b> Median	<b>Testimonial</b> Mean±SD	<b>Testimonial</b> Median	
<b>Video characteristics</b>					
Number of views	793446,2±1445548,2	166854	264517,2±392098,5	29013	0,115
Duration in seconds	348,8±314,9	246	445,5±280,8	393,5	0,225
Days since upload	1453,5±953,0	1288	1380,3±790,2	1272,5	0,983
Number of comments	349,6±530,0	130	473,4±529,1	220	0,623
Number of likes	4809,6±7393,7	1827,5	2595,3±3739,3	295	0,255
Number of dislikes	226,6±351,7	68	184,0±283,8	9	0,270
Interaction index	0,86±0,59	0,72	1,10±0,65	0,93	0,338
Viewing rate	47151,9±67760,2	19944,6	21579,2±38712,4	2506,4	0,115
Number of daily views	471,5±677,6	199,4	215,8±387,1	25,1	0,115
Video Power	94,5±3,6	95,6	95,0±2,6	95,6	0,920

Table 6. Total content score, Global Quality Score and modified DISCERN correlation with YouTube video demographics

		Total Content Score	Global Quality Score	Modified DISCERN
Global Quality Score	r	0,873		
	p	<0,001*		
Modified DISCERN	r	0,883	0,900	
	p	<0,001*	<0,001*	
Number of views	r	0,071	0,093	0,135
	p	0,564	0,448	0,267
Duration in seconds	r	0,082	0,085	0,086
	p	0,501	0,490	0,484
Days since upload	r	0,065	0,066	0,057
	p	0,597	0,590	0,642
Number of comments	r	0,140	0,147	0,191
	p	0,277	0,254	0,137
Number of likes	r	0,107	0,166	0,199
	p	0,394	0,183	0,109
Number of dislikes	r	0,067	0,096	0,125
	p	0,591	0,446	0,319
Interaction index	r	0,005	0,047	0,061
	p	0,968	0,710	0,629
Viewing rate	r	0,089	0,114	0,167



		Total Content Score	Global Quality Score	Modified DISCERN
Number of daily views	p	0,467	0,351	0,170
	r	0,089	0,114	0,167
Video Power	p	0,467	0,351	0,170
	r	0,037	0,119	0,123
	p	0,771	0,342	0,326

\*p<0.05

#### Hosted file

Table 1.docx available at <https://authorea.com/users/734135/articles/711356-youtube-as-a-source-of-information-on-vertigo-for-patients>

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