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YouTube as a source of patient information on deep vein thrombosis

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ABSTRACT

Objectives: A significant number of videos that provide information about deep vein thrombosis (DVT) are available on YouTube, and the quality of these videos has not been evaluated; therefore, this study aimed to evaluate the quality of these videos.

Materials and methods: The terms "deep vein thrombosis," "deep venous thrombosis," and "DVT" were searched on YouTube. The quality of each video was evaluated by three independent vascular surgeons according to the DISCERN score, Journal of the American Medical Association score, and DVT patient information score. Interrater agreement was ascertained.

Results: The mean total DISCERN score and mean DVT patient information score of all the videos were 38.2±12.9 and 5.0±3.4, respectively. According to the DVT patient information scoring system, eight (9.3%) videos were categorized as very useful, 37 (43.0%) as moderately useful, and 41 (47.7%) as poor.

Conclusion: The educational quality of YouTube videos on DVT must be enhanced.

Keywords: Deep vein thrombosis, DISCERN score, YouTube.

Nearly five billion people are active internet users all over the world.[1] The ways of getting information are changing in every field with the increase in the use of the internet. Quick, easy, and cheap access to medical information on the internet is also a part of this development.[2,3] Patients and caregivers are particularly prone to seeking health information online.[4,5] YouTube is the world's most popular video-sharing site; therefore, it has become a prominent source of open-access information for patients to learn about their diseases.[6] When searching on YouTube, videos are ranked by various criteria, such as view counts, comments, likes, and dislikes; however, these may not reflect the video's quality. The YouTube search algorithm is based on popularity and may cause videos with poor content to be presented on the top lines.

Deep vein thrombosis (DVT) is a common and important disease characterized by the formation of blood clots in the deep vein, and it is an important cause of morbidity and mortality.[7] Many videos that provide information about DVT are available on YouTube. To date, the quality of DVT videos on YouTube has not been evaluated. Hence, this study aimed to evaluate the quality of videos on the diagnosis, treatment, and prognosis of DVT.

MATERIALS AND METHODS

Search strategy

The terms "deep vein thrombosis," "deep venous thrombosis," and "DVT" were searched on YouTube (Alphabet Inc., Mountain View, CA, USA) on January 10, 2022. The search was done in incognito mode so

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that it would not be affected by the user-dependent YouTube search algorithm. The top 50 videos for each search term were included based on their relevance. As a result, a total of 150 videos were examined. Exclusion criteria for this study were videos with languages other than English, videos with irrelevant content, duplicated videos, and videos that could not be evaluated due to poor audio or visual quality. Sixty-four of these videos were excluded from the study since they satisfied at least one of the exclusion criteria. Of these videos, 57 were excluded due to duplication, six due to languages other than English, and one due to poor audio quality. The remaining 86 videos were included in the study to be analyzed (Figure 1).

Video assessment

The number of views, the duration, and the total number of likes of each video were recorded. The videos were analyzed in four groups according to their purpose: *(i)* information on DVT, *(ii)* patient experience, *(iii)* technical information for professionals (e.g., use of ultrasound in DVT), and *(iv)* advertisement. Additionally, the videos were divided into four groups according to the main speaker who gave information about DVT: *(i)* physicians, (ii) nonphysician healthcare professionals (nurse, paramedic, physiotherapist, or medical student), *(iii)* patients, and *(iv)* unclassified.

Three different tests were used to evaluate the quality of the videos. The first test is the DISCERN score, which is an effective method for assessing the quality of health information on the internet.[8] Each of the 16 items was allocated a score between 1 and 5, and the total DISCERN score was evaluated. A score of 63-75 was determined as excellent, 51-62 as good, 39 to 50 as moderate, 27-38 as poor, and 16-26 as very poor.[9] In addition to the DISCERN score, the Journal of the American Medical Association (JAMA) benchmark criteria were also used to evaluate the videos. The scoring system, which consists of four criteria, examines authorship, attribution, disclosure, and currency.[10]

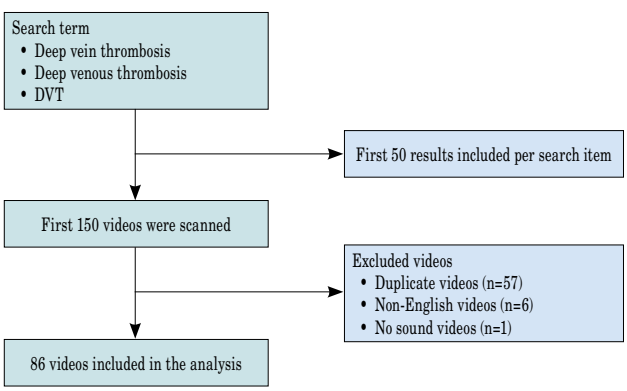

Figure 1. Selection methodology of YouTube videos.
DVT: Deep vein thrombosis.

No score tool exists to assess the quality of patient-informative videos on DVT. A DVT patient information scoring system has been developed (Table 1), consisting of pulmonary embolism, postthrombotic syndrome, and the 13 chapters of the information for patients' section of the 2021 European Society for Vascular Surgery (ESVS) clinical practice guidelines on the management of venous thrombosis.[11] The videos were categorized according to the DVT patient information scoring system, with a score of 10-15 considered very useful, 5-9 moderately useful, and 0-4 poor.

Three independent authors analyzed all videos and scored them according to the DISCERN score, JAMA benchmark criteria, and DVT patient information scoring system.

Statistical analysis

Statistical analyses were carried out using IBM SPSS version 23.0 software (IBM Corp., Armonk, NY, USA). Estimation of the interrater agreement was analyzed using an intraclass correlation coefficient (ICC) and its 95% confidence intervals (CIs). Descriptive statistics are reported as percentages for categorical variables and means and standard deviation for continuous variables. Categorical variables were compared by the chi-square test or Fisher exact test. Normal and abnormal continuous variables were compared by Student's t-test and the Mann-Whitney U test. Statistical tests were two-sided, and a p value of <0.05 was considered statistically significant.

RESULTS

The interreviewer agreement total DVT patient information score (ICC, 0.958; 95% CI: 0.785-0.984), total JAMA score (ICC, 0.902; 95% CI: 0.860-0.933), and total DISCERN score (ICC, 0.963; 95% CI: 0.887-0.983) were high.

The total number of views of all videos was 11,398,375. The most-viewed video was watched 4,423,159 times. The mean view number was 18,230.5±515,116.2. The mean duration of the videos was 559.94±835.02 sec. The longest video duration was 5,036 sec, and the shortest video duration was 33 sec.

Table 1. Deep vein thrombosis patient information score

What is DVT?	Treatment?	DVT in arm?
Why does DVT occur?	Thrombectomy methods and recommendations?	Treatment of conditions that cause DVT?
Which veins can be affected by?	DVT in calf vein?	Special circumstances to be considered in DVT treatment?
What are the symptoms of DVT?	Recurrence risk?	What is pulmonary embolism?
How diagnose?	Treatment of SVT?	What is post thrombotic syndrome?

DVT: Deep vein thrombosis.

The mean number of likes was 536.91±1,042.273. The most liked video had 6,701 likes, and 15 videos had less than 10 likes. The oldest video was posted 5,403 days ago, while the newest video was posted 71 days ago. The mean time since the videos were posted was 1,919.09±1,263.04 days.

Thirteen (15.1%) of all videos provided information directly to medical professionals. The content of 12 videos was about the use of ultrasound in DVT, and one was a doctor-oriented webinar. Sixty-three (73.3%) videos provided direct information about DVT. Of these 63 videos, 18 were educational videos for medical students or nurses. In six (7.0%) videos, DVT patients described their disease history. Three doctors were accompanying patients who explained their DVT disease history. Four (4.7%) videos had heavy advertising content aimed at selling a product.

Physicians were the main speakers in 57 (66.3%) of the videos. In 17 (19.8%) videos, nonphysician healthcare professionals or medical students were the main video presenters. Of the remaining 12 videos, patients were the main speakers in two (2.3%) videos, and people whose information could not be reached presented the remaining 10 (11.6%) videos.

The mean total DISCERN score of the videos was 38.23±12.866). Among all videos, the highest total DISCERN score was 77, and the lowest was 16. According to the total DISCERN score, eight (9.3%) videos were determined as excellent, four (4.7%) as good, 25 (29.1%) as moderate, 34 (39.6%) as poor, and 15 (17.4%) as very poor. The mean total JAMA score of the videos was 2.38±0.770.

The mean DVT patient information score of the videos was 4.97±3.171. According to the DVT patient information scoring system, eight (9.3%) videos were categorized as very useful, 37 (43.0%) videos as moderately useful, and 41 (47.7%) videos as poor.

There is a significant correlation between the DISCERN score and JAMA ($p<0.001$; $r=0.428$) and DVT patient information scores ($p<0.001$; $r=0.777$) of the videos. No correlation was found between the DISCERN score and total views ($p=0.403$), daily views ($p=0.768$), total likes ($p=0.181$), or daily likes ($p=0.714$). Likewise, no correlation was found between the JAMA score and total views ($p=0.749$), daily views ($p=0.904$), total likes ($p=0.356$), or daily likes ($p=0.214$). No correlation was found between the DVT patient information score and total views ($p=0.327$), daily views ($p=0.733$), total likes ($p=0.726$), or daily likes ($p=0.112$).

Table 2. Comparison of the videos in which the physician is the main speaker with other videos

	Videos with physician as the main speaker (n=57)	Other videos that physicians are not the main speaker (n=29)	
	Mean±SD	Mean±SD	*p*
Total views	113.2±585.5	170.4±342.9	0.629
Daily views	42.4±177.3	93.0±100.1	0.159
Total likes	309.7±697.8	983.5±1.418.6	0.004*
Daily likes	0.2±0.4	1.0±1.7	<0.001*
Video duration (sec)	686.1±972.3	430.6±425.5	0.181
Total DISCERN score	41.2±12.7	32.4±11.2	0.002*
Total JAMAS values	2.6±0.7	1.9±0.7	<0.001*
Total DVT patient information score	5.6±3.2	3.7±2.8	0.009*

SD: Standard deviation; DVT: Deep vein thrombosis.

Total DISCERN score, JAMA score, and DVT patient information score were found to be statistically higher in videos where the physician was the main speaker. The videos that the physicians were not the main speakers were found to have statistically higher like rates. Table 2 demonstrates the comparison of the videos in which the physician is the main speaker with the other videos.

DISCUSSION

YouTube, the most clicked website after Google, is one of the leading sources of information with its free content, accessibility, superior technology, and visual and auditory appeal.[12] The most important feature of YouTube is that all users can upload videos. Anyone who creates a YouTube account can share open-source videos on any topic they choose. Videos that give information about diseases are sometimes uploaded to YouTube by hospitals, physicians, medical students, medical firms, and nonphysician health professionals. Patients watch YouTube videos to learn about their complaints and diseases and also share videos that provide information about their disease processes.[13]

YouTube is generally considered an inadequate source of medical information since its first systematic evaluation.[14] In our study, we evaluated YouTube videos that give information about DVT. There are some studies in the literature evaluating the quality of videos about other diseases on YouTube.[15,16] We have determined that the quality of the informative videos on DVT is moderate compared to the DISCERN score. Considering that physicians are the main speakers in most of the videos, we think the mean DISCERN score is low. We attribute this to the fact that they did not provide much detail in explaining the treatment options, focusing on defining DVT and devoting a significant amount of video time to the pulmonary embolism mechanism.

The DVT patient information score is a scoring system based on the 2021 European Society for Vascular Surgery (ESVS) clinical practice guidelines on the management of venous thrombosis.[11] There is a correlation between DVT patient knowledge scores and DISCERN scores since detailed videos have score high in both of these criteria.

YouTube videos always show upload dates. However, the creation date of the videos is not clear. All videos were given at least 1 point according to the currency of the JAMA benchmarks criteria as the upload date of the videos is known. Despite this, the JAMA score remained low for videos, particularly since references and sources are not clearly mentioned in most YouTube videos, as reported by Szmuda et al.[16]

The total DISCERN score, total JAMA score, and total DVT patient information score are higher in videos where physicians are the main speakers compared to other videos. The fact that there was no difference in the video durations between the two groups suggests that the physicians use time more effectively by using more technical terms in the videos. As shown in similar studies, the use of technical terms may have caused the physicians' videos to be more difficult to understand and more boring, resulting in low like rates.[17,18]

There is no correlation between the daily viewing and like rates of the videos and the total DVT patient information score, the DISCERN score, and JAMA score, suggesting that the like and view rates cannot be used to determine the quality of the videos. There are studies revealing that the content of the videos, including animations or other visually appealing graphics, rather than the information quality increases the rate of daily views or likes.[19] In our study, we detected only one video that presented false information about DVT. We think that the main problem in the videos is that little information is given on the treatment of DVT.

The main limitation of this study is that only YouTube was evaluated. In addition, only the top 50 videos of relevance to each search title was evaluated. YouTube's content is constantly evolving, with over 500 hours of video uploaded every minute. With the newly added videos, different results can be obtained. Therefore, our analysis represents one point in time. While we were searching for DVT videos, the total dislikes of the videos were not visible for standard users due to a recent decision of the website. Consequently, we could not perform the audience engagement analysis, which was evaluated in similar studies.

In conclusion, the content of the videos that provide information about DVT on YouTube is insufficient. As a result of the study, there is no relationship between views and likes rates of videos and their information quality. We think that it is beneficial to upload high quality videos on DVT with attractive visuals to YouTube.

Ethical approval: No ethical approval was required since all data was publicly available.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Authors' contribution: All authors participated in the literature review process and analyzed all videos and scored them according to the DISCERN score, JAMA benchmark criteria, and DVT patient information scoring system. Z.M.D. and B.T. wrote the study. M.B. took part in the critical review of the study. Again, all authors contributed to the writing of the article by reading all sources. Finally, B.T. corrected the errors in the academic language of the article. All authors have read and approved the final version of the article.

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