

Original Article

Vascular access on YouTube: Navigating the stream of information for hemodialysis patients

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Abstract

Aim: End-stage renal disease (ESRD) presents significant challenges for patients and healthcare systems. Treatment options include renal transplant, peritoneal dialysis, and hemodialysis, with hemodialysis being the most common, necessitating suitable vascular access like arteriovenous fistula (AVF), graft, or catheter. This study aims to analyze the quality of YouTube videos on vascular access for hemodialysis, using the 2018 Clinical Practice Guidelines of the European Society for Vascular Surgery (ESVS) as a benchmark and employing JAMA, Global Quality, and DISCERN scores. To our knowledge, this is the first study evaluating YouTube content quality on this topic.

Material and Methods: A YouTube search for 'arteriovenous fistula' was conducted, analyzing the first 200 videos based on predetermined criteria. Exclusions included videos lacking sound, not in English, off-topic, or duplicates. Data collected included uploader details, upload date, views, comments, likes, and duration. Video accuracy was assessed using the DISCERN tool, JAMA Benchmark Criteria, and Global Quality Scoring System (GQSS).

Results: Out of 200 videos, 13 were excluded, leaving 187 for analysis. The interobserver agreement was high ($\kappa=0.967$). The videos amassed 12,854,643 views, with a median duration of 5 minutes and a median of 3412 views per video. Most views were for videos with poor DISCERN scores. There was a significant association between DISCERN scores and video characteristics. Videos with higher DISCERN scores had longer durations ($p=0.01$). However, videos with lower scores received more likes and views ($p<0.01$). The mean DISCERN score was 33.7, indicating poor quality, with only 18.8% rated as good or excellent.

Conclusion: The study underscores the variability in the quality of YouTube content regarding vascular access for hemodialysis. Patients are encouraged to prioritize videos uploaded by healthcare professionals, ensuring both quality and accuracy. Despite limitations, this study contributes to informed decision-making in the context of hemodialysis vascular access.

Keywords: Arteriovenous fistula, hemodialysis, YouTube

INTRODUCTION

End-stage renal disease (ESRD) is a significant problem for patients and healthcare system. It is estimated that 850 million people have some form of kidney disease [1]. In United States, the incidence of ESRD in 2017 was 124,500 new cases. Prevalance in United States was 746,557 in 2017 [2]. There are several treatment options for ESRD, consisting of renal transplant,

peritoneal dialysis and hemodialysis. Most frequent treatment option is hemodialysis. For hemodialysis vascular access must be available. There are several modalities for vascular access. They are arteriovenous fistula (AVF), arteriovenous graft, central venous catheter.

The internet has become a source of information during the past decade. Information about health is sought by 81% of

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internet users [3]. Especially visual content has been increasing rapidly. Youtube is the platform with the highest number of user population in terms of video content and has over 1 billion users [4]. Even unregistered users can search a video and access the information freely. Reliable medical videos that have passed quality control can be accessed by paid memberships on various platforms [5]. The reason why YouTube is frequently preferred is that it provides free access.

In the USA, over fifty percent of patients dealing with one or more chronic diseases utilize the internet to acquire medical information [6]. Nevertheless, accessing both peer-reviewed and uncontrolled information may result in adverse outcomes. Numerous prior studies have explored YouTube as a source of information. Many authors analysed various topics in Youtube, such as tonsillectomy, prostate cancer, gallstone disease, heart transplantation, schizophrenia etc. [7-9]. One study showed that videos for prostate cancer can not be used for informative purposes [10]. However, a study about infantile spasm showed that Youtube can be good source of information [11].

In this study, authors aimed to analyse Youtube videos for accurate and up-to-date information about vascular access for hemodialysis. Accurate information content of the videos was cross-checked with Vascular Access: 2018 Clinical Practice Guidelines of the European Society for Vascular Surgery (ESVS) [12]. To the best of our knowledge, this is the first study to evaluate the quality of YouTube videos about vascular access for hemodialysis.

MATERIAL AND METHODS

The research was designed as a cross-sectional study. On August 18, 2022, a search was conducted on www.youtube.com using

the keyword 'arteriovenous fistula'. The results were arranged according to the default feature (relevant), and the first 200 videos were analyzed. Videos were excluded from the study if they met any of the following criteria: a) lacking sound, b) not being in English, c) containing off-topic content, or d) being duplicates. The decision to include 200 videos in the study was based on the common user behavior of reviewing videos up to the first 10 pages [13]. Information extracted from the website included details such as the uploader (government body, non-profit association, physician, private health institution), upload date, number of views, comments, likes, and video duration. Additionally, the content of the videos (covering general information, surgical and medical treatment, symptoms, etc.) was documented. The primary endpoint of the study aims to evaluate the quality of the videos viewed using DISCERN, Journal of the American Medical Association (JAMA), and Global Quality Scale (GQS) systems, and to assess the usability of YouTube as a source of information.

Evaluation of Video Content

The accuracy of the information presented in the video content was assessed based on the 2018 ESVS vascular access guideline. Using the DISCERN tool, the reliability of information was evaluated with a scale of 5 options across 5 questions. Additionally, medical information found on the internet was rated out of 4 points using the JAMA Benchmark Criteria Scoring System. The quality of information available on the internet was further assessed out of 5 points utilizing the GQS system (Table 1).

Table 1. JAMA and GQS scoring system	
JAMA, Global Quality scoring and DISCERN scoring system	
JAMA score	
Authorship	Authors and contributors, their affiliations, and relevant credentials should be provided
Attribution	References and sources for all content should be listed clearly, and all relevant copyright information should be noted
Disclosure	Website ‘ownership’ should be prominently and fully disclosed, as should any sponsorship, advertising, underwriting, commercial funding arrangements or support, or potential conflicts of interest
Currency	Dates when content was posted and updated should be indicated
Global Quality score	
1	Poor quality, very unlikely to be of any use to patients
2	Poor quality but some information present, of very limited use to patients
3	Suboptimal flow, some information covered but important topics missing, somewhat useful to patients
4	Good quality and flow, most important topics covered, useful to patients
5	Excellent quality and flow, highly useful to patients

Table 1. JAMA and GQS scoring system							
DISCERN scoring system							
Question number	What is investigated?	Question rating					
		No partially			Yes		
Section 1	Is the publication reliable?						
1	Are the aims clear?	1	2	3	4	5	
2	Does it achieve its aims?	1	2	3	4	5	
3	Is it relevant?	1	2	3	4	5	
4	Is it clear what sources of information were used to compile the publication (other than the author or producer)?	1	2	3	4	5	
5	Is it clear when the information used or reported in the publication was produced?	1	2	3	4	5	
6	Is it balanced and unbiased?	1	2	3	4	5	
7	Does it provide details of additional sources of support and information?	1	2	3	4	5	
8	Does it refer to areas of uncertainty?	1	2	3	4	5	
Section 2	How good is the quality of information regarding treatment choices?						
9	Does it describe how each treatment works?	1	2	3	4	5	
10	Does it describe the benefits of each treatment?	1	2	3	4	5	
11	Does it describe the risks of each treatment?	1	2	3	4	5	
12	Does it describe what would happen if no treatment is used?	1	2	3	4	5	
13	Does it describe how the treatment choices affect overall quality of life?	1	2	3	4	5	
14	Is it clear that there may be more than 1 possible treatment choice?	1	2	3	4	5	
15	Does it provide support for shared decision making?	1	2	3	4	5	
Section 3	Overall rating of the publication						
16	Based on the answers to all of these questions, rate the overall quality of the publication as a source of information about treatment choices	1, 2, 3 Low moderate			4, 5 High		

DISCERN, Quality Criteria for Consumer Health Information.

Who evaluated video contents?

The evaluation of 200 videos was conducted by AY and SS, who are cardiovascular surgeons, and the scores were documented.

Statistical Methods

The agreement between two physicians with respect to GQSS was evaluated utilizing the kappa statistic, and 95% confidence intervals (CI) for the kappa statistic were generated through bootstrapping involving 1000 random samples. Descriptive statistics were employed, indicating mean and standard deviation for continuous variables demonstrating a normal distribution, while median and interquartile range (IQR) were utilized for continuous variables exhibiting a skewed distribution. The normality of variables was checked using the Shapiro–Wilk test. Disparities among continuous variables across the three categories assessing usefulness were appraised through analysis of variance for normally distributed variables, and the Kruskal–Wallis test for skewed variables. Categorical variables

were presented as percentages or ratio, and distinctions across categories were examined using the chi-square (χ^2) test or Fischer's test as appropriate. A significance level of 0.05 or lower was considered statistically significant. The statistical analyses were conducted using the Statistical Package for Social Science (version 26.0; SPSS Inc., Chicago, IL, USA).

RESULTS

For the study, a total of 200 videos were evaluated. Thirteen videos were excluded from the analysis. Among these exclusions, 7 (3.5%) were not in English, 5 (2.5%) lacked sound, and 1 (0.5%) was deemed off-topic. The interobserver agreement was calculated as 0.967 (95% CI 0.955-1.000). Collectively, the videos amassed a total of 12,854,643 views, with a median duration of 5 minutes. On average, the videos were watched for a median of 3412 times. According to the DISCERN scoring, videos with very poor and poor scores accounted for the majority of the total number of views (Table 2). Additionally, videos with

higher DISCERN scores had a higher median duration ($p=0.01$). Conversely, videos with lower scores received more likes and views compared to those with higher scores ($p<0.01$). Similarly, the number of comments was statistically significantly lower in videos with higher ratings ($p=0.01$). Out of the users who uploaded the videos, 140 (74.8%) were physicians. Additionally, 12 (6.4%) videos were uploaded from the university hospital channel, and 35 (18.7%) were uploaded from private health institution pages. None of the videos were found to be uploaded by a government agency. It was noted that high-scoring videos were predominantly uploaded by physicians ($p<0.001$) (Table 3). Furthermore, it was observed that high-quality videos were mainly intended for individuals in professional healthcare services ($p=0.05$) (Table 4). There was no information that conflicted with the content outlined in the 2018 ESVS guide.

Table 2. DISCERN, JAMA and GQS scores

DISCERN score (mean)	33.7
16-26 (very poor), n (%)	67 (35.8)
27-38 (poor), n (%)	39 (20.8)
39-50 (mediocre), n (%)	46 (24.6)
51-62 (good), n (%)	21 (11.3)
63-80 (excellent), n (%)	14 (7.5)
JAMA Score, median (IQR)	2 (1-3)
GQS Score, median (IQR)	2 (1-5)

JAMA: Journal of the American Medical Association, GQS: Global Quality Scale

Table 3. Comparison of video characteristics based on the DISCERN classification

Variables	Total count	DISCERN					p
		Very poor	Poor	Mediocre	Good	Excellent	
Cumulative viewership (n)	12.854.643	2.367.443	5.129.708	3.124.004	1.689.667	543.821	0.01
Duration of video (min) (IQR)	5 (2-11)	2 (1-4)	2 (1-4)	3 (2-5)	5 (2-13)	6 (3-15)	0.01
Number of views, median (IQR)	3412 (242-12678)	564 (85-2219)	839 (101-5466)	611 (115-4801)	211 (64-1435)	101 (46-2245)	0.01
Views per day, median (IQR)	4 (1-12)	3 (1-9)	6 (2-11)	5 (2-9)	3 (1-11)	3 (1-9)	<0.01
Likes, median (IQR)	2 (1-10)	5 (2-21)	6 (1-15)	3 (1-4)	2 (1-4)	2 (1-4)	<0.01
Comments, median (IQR)	1 (0-3)	3 (2-10)	5 (3-18)	3 (1-8)	2 (1-4)	1 (0-4)	0.05
Source, n (%)							
Physician	140 (74.8)	42 (22.4)	48 (25.6)	21 (11.2)	17 (9.1)	12 (6.4)	<0.001
University hospital	12 (6.4)	5 (2.6)	7 (3.7)	0 (0)	0 (0)	0 (0)	0.01
Private healthcare instution	35 (18.7)	15 (8)	12 (6.4)	4 (2.1)	4 (2.1)	0 (0)	0.01
Goverment instution	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	-
Target audiance n (%)							
Healthcare personnel	24 (12.8)	0 (0)	8 (4.2)	6 (3.2)	4 (2.1)	6 (3.2)	0.05
Patient	89 (47.5)	25 (13.3)	37 (19.7)	12 (6.4)	10 (5.3)	5 (2.6)	0.01
Uncertain	74 (39.7)	46 (24.5)	28 (14.9)	6 (3.2)	4 (2.1)	0	0.03

Table 4. Comparison of DISCERN, JAMA, and GAS scores based on the uploader

	Physicians	University hospitals	Private healthcare instution	Goverment instution	P
DISCERN score	40.2±13.6	33.5±12.4	37.2±11.5	0	0.02
JAMA score, median (IQR)	3 (1-4)	2 (1-3)	2 (1-3)	0	0.05
GQS score ,median (IQR)	3 (1-5)	2 (1-4)	2 (1-4)	0	0.05

JAMA: Journal of the American Medical Association, GQS: Global Quality Scale

Based on the DISCERN scoring, the videos received an average score of 33.7, categorizing them as poor. Videos with good and excellent scores comprised 18.8% of all videos. The median JAMA score was 2 points, while the median value for GQSS was also 2 points.

It was noted that the video duration correlated with the DISCERN score and its subcategories, including Reliability and Treatment Modality, as well as with the Rating and JAMA score. Specifically, the DISCERN score, Rating, and JAMA score demonstrated a strong correlation with video duration, with respective R2 values of 0.64, 0.67, and 0.56 (Table 5).

Table 5. Correlation of DISCERN, JAMA and GQS scores with video duration		
	Video duration (min)	
	R ²	p
DISCERN score	0.64	0.01
DISCERN reliability	0.34	0.04
DISCERN treatment modality	0.41	0.03
DISCERN overall rating	0.67	0.01
JAMA score	0.56	0.01
GQS score	0.33	0.05

JAMA: Journal of the American Medical Association, GQS: Global Quality Scale

DISCUSSION

The present study delves into the assessment of the quality and accuracy of information available on YouTube regarding arteriovenous fistula surgery in the context of chronic kidney disease, an ailment affecting a substantial population worldwide. In the realm of end-stage renal disease treatment, hemodialysis holds significant prominence. Especially chronic renal failure and dialysis patients frequently utilize internet-based information sources in their disease management and decision-making processes regarding renal replacement therapy [6]. In the contemporary era, YouTube has become a widely utilized source of information. This research aims to evaluate the content quality and accuracy of information accessible on YouTube related to AVF surgery.

Previous studies have assessed YouTube's accuracy regarding various medical topics [14-17]. In our study, the mean DISCERN score was 33.7, with a median JAMA score of 2 and a median GQS score of 2. Based on these findings, it is evident that the quality of the videos and the information they aim to convey is generally subpar and of low quality. Following that, a growing body of research piqued people's interest in the often deceptive

and poor quality YouTube videos. Notwithstanding these drawbacks, more people are using this video-sharing website to obtain and provide health information due to its growing popularity [18].

When the uploaders of videos were examined, it was observed that 74.8% were created by physicians. Notably, no government institutions shared videos on YouTube regarding this subject. Additionally, the DISCERN score of videos uploaded by physicians was found to be higher compared to those uploaded by other users (p<0.001). Despite Bolac et al.'s assertion that the uploader has no effect on video quality, our study indicates that physicians produced higher-quality content and conveyed more accurate information [19]. The absence of content from state institutions regarding AVF is notable and reflects a deficiency in this regard.

It was noticed that 47.5% of the videos with a low DISCERN score were aimed at patients. The poor quality of videos intended for patients may contribute to misinformation and indirectly pose health risks. Additionally, it is worth mentioning that videos with high DISCERN scores are more targeted towards physicians.

The significance of structured and verified sources in medical information cannot be overstated, particularly in ensuring accurate patient education. While YouTube provides visually engaging and easily accessible content, it is imperative to assess the reliability and quality of the information shared. A study conducted highlighted the importance of high-quality medical information on platforms like YouTube, specifically focusing on spine tumors [20]. With the substantial viewership on YouTube, the quality of medical content on the platform plays a critical role in effectively educating patients. In the realm of patient education, the visual nature of YouTube videos can greatly aid in simplifying complex medical concepts. Nevertheless, it is crucial to scrutinize the accuracy and trustworthiness of these videos to guarantee that patients are receiving precise and dependable information. Research stresses the necessity for credible and informative content on YouTube to improve patient comprehension and decision-making regarding medical issues. Hence, while the visual appeal of YouTube videos can enhance patient education, it is paramount to prioritize the quality and reliability of the information presented to ensure that patients are equipped with precise and comprehensive medical knowledge.

The study on the multifaceted role of YouTube as a source of knowledge in A-V Fistula surgery emphasizes the importance of balancing accessibility and accuracy to enhance patient empowerment in this surgical domain. Conti's research underscores the visibility and impact that YouTube offers in reaching a broader audience, which is crucial for advancing patient empowerment in A-V Fistula surgery [21]. Establishing guidelines for responsible use of platforms like YouTube can help ensure that accurate and reliable information is accessible to

patients seeking knowledge about their medical condition. This resonates with the need to establish guidelines for responsible use of online platforms like YouTube to empower patients with accurate information regarding A-V Fistula surgery.

There are limitations inherent to the nature of this study. It is a cross-sectional study, providing a snapshot observation on a specific date. There is a possibility that the videos encountered may not be the same in searches conducted on different dates or in other countries. We included the first 200 videos in the study, corresponding to 10 pages on the YouTube site, as it has been demonstrated that users typically do not venture beyond the initial few pages when seeking information online [13]. The data we could gather from YouTube is restricted to what is accessible on the page. For instance, the option to dislike videos was concealed and unavailable for our assessment. Furthermore, details such as the identities of viewers, their viewing frequencies, and which segments of the videos were watched more frequently were beyond our reach. The evaluation of the videos was conducted by two healthcare professionals. While subjectivity may arise in this process, it is important to note that the videos were assessed blindly, and there was a high level of inter-observer agreement.

CONCLUSION

In light of the scoring systems, it is evident that the majority of videos analyzed in this study fall into the category of low quality. Notably, videos of higher quality predominantly originate from healthcare professionals. The positive correlation observed between video duration and JAMA, GQS and DISCERN scores underscores the potential impact of video length on the overall quality and comprehensiveness of information provided.

The variability in the quality of information available on YouTube for AVF surgery highlights the importance of a discerning approach for patients seeking knowledge. In navigating the vast array of videos, it is recommended that patients prioritize content uploaded by healthcare professionals, ensuring both quality and accuracy. The preference for shorter videos aligns with the need for concise and focused information, facilitating better comprehension for viewers seeking insights into AVF surgery.

As the study suggests, the quality of information on AVF surgery within the realm of YouTube is inconsistent. However, patients can optimize their learning experience by gravitating towards videos uploaded by healthcare professionals, characterized by higher quality and concise presentations. This recommendation serves as a guiding principle for individuals navigating online platforms, reinforcing the significance of reliable sources and contributing to informed decision-making in the context of AVF surgery.

Ethics Committee Approval: Due to the nature of the study, there is no need to apply to the ethics committee.

Patient Consent for Publication: Not necessary for this manuscript.

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

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