

Original Research

An evaluation of YouTube video content regarding erectile dysfunction

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Purpose: YouTube™ is one of the most popular social media platforms on the internet, and patients with chronic disease frequently use it to seek treatment options. In this study, we aimed to evaluate the quality of YouTube videos about erectile dysfunction.

Materials & methods: The terms "erectile dysfunction treatment", "erectile dysfunction surgery", and "cure erectile dysfunction" were entered into the YouTube search bar. A total of 56 videos were included in the study. Videos' view counts; upload dates; like, dislike, and comment counts; uploader qualifications; length; and content were recorded. Video power index (VPI), Quality Criteria for Consumer Health Information (DISCERN), and Journal of the American Medical Association (JAMA) scores were determined.

Results: Thirty-two (57.1%) videos consisted of real images, and 24 (42.9%) contained animated images. Twenty-four (42.9%) videos were uploaded by physicians, and 32 (57.1%) were uploaded by non-physicians. The mean like count of the videos was $5,307 \pm 17.618$, the mean dislike count was 560.07 ± 1548.07 , and the mean comment count was 235 ± 373 . The mean VPI value of the videos was calculated as 81.19 ± 21.19 , the DISCERN score was 30.5 ± 8.1 , and the JAMA score was 1.23 ± 0.55 . Overall quality was very poor in 24 (42.9%) of the examined videos, poor in 21 (37.5%), average in 10 (17.9%), and good in one (1.8%).

Conclusion: The overall quality of YouTube content on erectile dysfunction was not sufficient to provide reliable information for patients. Physicians should warn patients about the limitations of YouTube and direct them toward more appropriate sources of information.

Keywords

Erectile dysfunction; YouTube; DISCERN; JAMA; Quality

1. Introduction

Erectile dysfunction (ED) is defined as the inability to achieve and maintain an erection sufficient for satisfactory sexual performance. ED is a natural part of aging and increasingly prevalent with age. With a prevalence of 5–20%, ED is a very common disease affecting the quality of life of patients and their partners [1]. Fifty percent of men at 50 years old, 60% of men at 60 years old, and 70% of men at 70 years old have ED [2]. Since in some cases ED may indicate other health problems (cardiac disease, diabetes, hypertension), it should be

carefully evaluated. Several treatment options are available for ED, including lifestyle changes, medication, and surgical and procedural treatments. Patients with ED often hesitate to ask questions about their disease and feel uncomfortable discussing this issue with their physicians. This may cause patients to seek information and research treatment options from other sources before visiting a urologist.

With the advancement in information technologies, internet research has become increasingly common on almost every topic [3]. Both patients and professionals search the internet to gain knowledge and experience. Studies in the

literature have reported that the internet is the main source of knowledge for patients who seek help with their diseases: they search the internet to receive information about their diseases, to utilize the experiences of patients with similar diseases, and even to buy drugs and/or treatments for their disease [3, 4]. It was found in a survey study that 80% of internet-using adults seek health-related data, and 70% of them report that the information they obtain affects their treatment decisions [5].

YouTube™ (San Bruno, California, USA, <http://www.youtube.com>) is one of the most popular social media platforms on the internet and is frequently used to share patient education materials with people who have chronic diseases [6]. It is a widely used open-access video-sharing website, providing access to unlimited video content for unregistered users and unlimited uploading for registered users. Users can also comment on and like or dislike videos to express their feelings and thoughts [7]. Five billion videos are watched daily, and 500 hours of video are uploaded every minute on YouTube. Of the global internet population, 95% watches YouTube [8].

YouTube research is widely performed on ED, which is a common disease among men worldwide. However, the quality of the existing health information on the Internet has raised questions. Authorship diversity and the absence of peer review on YouTube have led to the uploading of inaccurate and misleading health-related information [9, 10], which may be physically, emotionally, and financially harmful.

Studies have been performed about healthcare content on the Internet in the field of urology [10, 11]. Recently, Fode *et al.* evaluated YouTube content pertaining to ED. The authors assessed the videos using the Patient Education Materials Assessment Tool (PEMAT) and the Quality Criteria for Consumer Health Information (DISCERN) scales and reported that these videos were generally low quality and misleading [12]. In this study, we aimed to evaluate the most viewed videos on the treatment of ED in terms of content, accuracy, reliability, and quality.

2. Materials and methods

2.1 Data collection

For review, the terms “erectile dysfunction treatment”, “erectile dysfunction surgery”, and “cure erectile dysfunction” were entered into the YouTube search bar on January 15, 2020, and filtering options revealed the 100 most-viewed videos for evaluation. After non-English videos, repeat videos, and advertisements were excluded, a total of 56 videos that met the inclusion criteria were identified, and their titles were recorded.

The videos' view counts; upload dates; like, dislike, and comment counts; uploader qualifications, length; contents; and types (real or animation) were recorded. In addition, the video power index (VPI) values of the examined YouTube videos on ED were calculated as follows:

$$\text{VPI} = [\text{Like count}/(\text{Dislike count} + \text{Like count})] * 100$$

Furthermore, the daily view counts of the videos were

calculated as follows to prevent bias that could have resulted from the upload date:

$$\text{Daily total view count} = \text{Overall total view count at the time of viewing}/[(\text{viewing date}-\text{upload date}) \text{ in days}].$$

2.2 Evaluation of the videos

All videos were reviewed by two independent urologists and evaluated according to the DISCERN and the Journal of the American Medical Association (JAMA) scoring systems, which are commonly used to assess the quality of internet content.

2.3 DISCERN

DISCERN is a scale developed by professionals at Oxford University in the UK to evaluate internet healthcare content and the quality of the treatment options offered [13]. This scale ranges from 0 to 75 points, with every question scored on a 5-point scale. The video's quality is classified as excellent if it receives 63–75 points, good if it receives 51–62 points, average if it receives 39–50 points, poor if it receives 28–38 points, and very poor if it receives <28 points, as seen in Fig. 1 [14].

2.4 JAMA

JAMA is a scale evaluating video sources for accuracy, utility, and reliability and varies from 0 to 4 points. The scores obtained from the scale indicate insufficient data (1 point), partially sufficient data (2–3 points), and completely sufficient data (4 points) (Fig. 2) [15].

2.5 Statistical analysis

Statistical analysis of the data obtained from this study was performed with SPSS (IBM SPSS, Statistical Package for Social Sciences, IBM Inc., USA) version 22.0 statistical software. The normality of the data was tested with the Kolmogorov-Smirnov method. Since the variables were not normally distributed, a Mann-Whitney U test was used in the comparison of continuous variables. Continuous variables are expressed as mean \pm standard deviation, minimum and maximum values, and categorical variables as number and percentage. The mean DISCERN and JAMA scores were calculated by averaging the scores separately given by the two urologists. The correlation between the DISCERN and JAMA scores given to the videos separately by the two observers was analyzed with Spearman's correlation analysis. In addition, compliance between the observers was evaluated using Cronbach's α coefficients. Accordingly, compliance between the observers was considered unacceptable ($\alpha < 0.5$), poor ($0.5 \leq \alpha < 0.6$), acceptable ($0.6 \leq \alpha < 0.7$), or excellent ($0.7 \leq \alpha < 1.0$), and P values less than 0.05 were considered statistically significant.

3. Results

A total of 56 videos that met the inclusion criteria were included in the study. Of these videos, 32 (57.1%) consisted of real images, and 24 (42.9%) consisted of animated

Questions	No	Partly			Yes
Reliability of the publication					
1. Explicit aims	1	2	3	4	5
2. Aims achieved	1	2	3	4	5
3. Relevance to patients	1	2	3	4	5
4. Source of information	1	2	3	4	5
5. Currency (date) of information	1	2	3	4	5
6. Bias and balance	1	2	3	4	5
7. Additional sources of information	1	2	3	4	5
8. Reference to areas of uncertainty	1	2	3	4	5
Quality of information on treatment choices					
9. How treatment works	1	2	3	4	5
10. Benefits of treatment	1	2	3	4	5
11. Risks of treatment	1	2	3	4	5
12. No treatment options	1	2	3	4	5
13. Quality of life	1	2	3	4	5
14. Other treatment options	1	2	3	4	5
15. Shared decision making	1	2	3	4	5

FIG. 1. Scoring of the DISCERN scale [14].

images. When the contents of the videos were evaluated, general information about ED was found in nine (16.1%) videos, information about non-surgical treatment was found in 34 (60.7%), and information about surgical techniques was found in 13 (23.2%). The distribution of the videos by content is given in Fig. 3.

An evaluation of the videos' uploaders revealed that 24 (42.9%) were uploaded by urologists, 16 (28.6%) by health

organization channels, seven (12.5%) by other sources, five (8.9%) by hospital channels, and four (7.1%) by herbalists (Fig. 4). Of the 24 videos uploaded by physicians, five (20.8%) included general information, nine (37.5%) described non-surgical treatments, and 10 (42.7%) described surgical techniques. Among the evaluated videos, the oldest video was uploaded in 2008, and the newest one was uploaded in 2019.

The mean video length was 7.85 minutes (min-max: 1.82-

Section		Rating	
		No	Yes
Authorship	Authors and contributors, their affiliations, and relevant credentials should be provided	0	1
Attribution	References and sources for all content should be listed clearly, and all relevant copyright information should be noted	0	1
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	0	1
Currency	Dates when content was posted and updated should be indicated	0	1

FIG. 2. Scoring of the JAMA scale [15].

Video Contents About Erectile Dysfunction

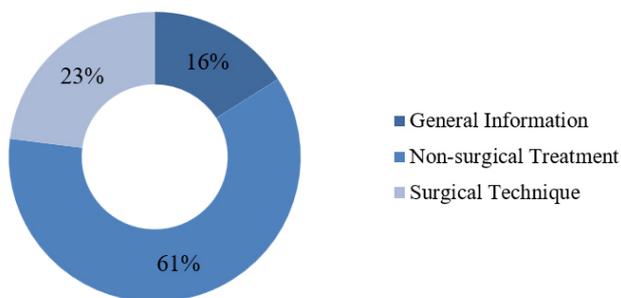


FIG. 3. Contents of the reviewed YouTube videos.

68.87). The mean view count was 1,107,681 (min-max: 54,684–20,350,683). The most viewed video was uploaded in 2017, and its mean daily view count was 21,535.11. The least viewed video was uploaded in 2014, and its daily view count was 25.5. Both videos were uploaded by physicians. View counts by uploaders are given in Fig. 5. The overall daily view count of the videos was $1,224.8 \pm 3,260$ (min-max: 17.61–21,535.11). The mean like count of the videos was $5,307 \pm 17.618$ (min-max: 0–131,089), the mean dislike count was $560.07 \pm 1,548.07$ (min-max: 0–11,471), and the mean comment count was 235 ± 373 (min-max: 0–2,140).

Videos Uploaders

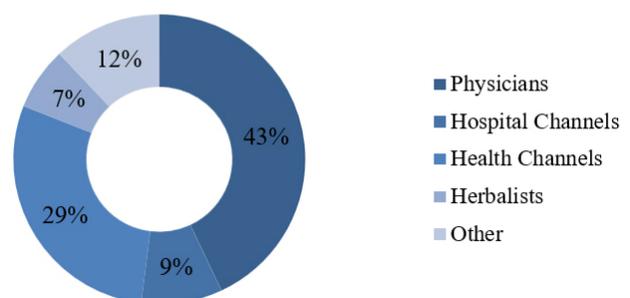


FIG. 4. Uploaders of the videos.

The overall characteristics of the examined YouTube videos on ED are given in Table 1.

The mean VPI value of the videos was calculated as 81.19 ± 21.19 (min-max: 0–97.71). The mean VPI value was found to be 86.2 ± 8.9 in the videos containing real images and 85 ± 8.2 in the animation videos; the difference between them was not statistically significant ($P = 0.617$). In addition, the mean VPI value of the videos was 84.4 ± 9.3 in the videos uploaded by physicians and 87.3 ± 7.5 in those uploaded by lay persons or organizations; the difference was not statistically significant ($P = 0.233$).

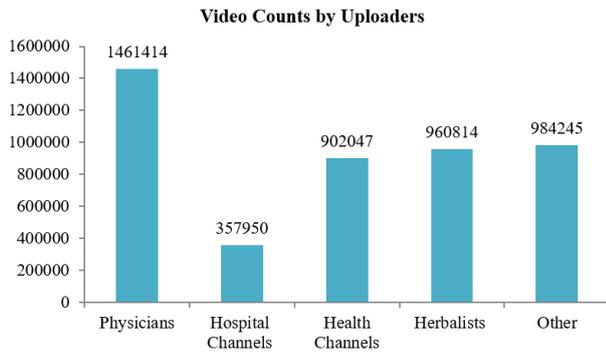


FIG. 5. View counts according to uploader category.

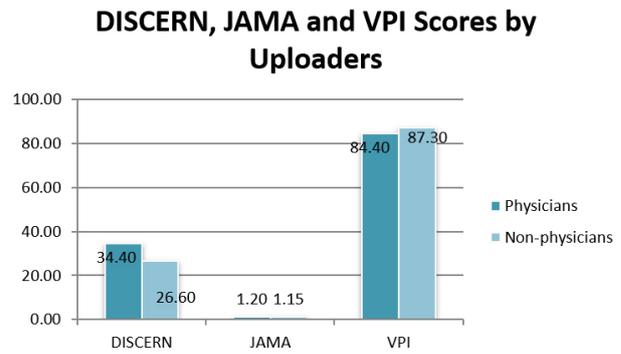


FIG. 6. Comparison of the mean DISCERN and JAMA scores and the VPI index of the YouTube videos for physicians and non-physicians.

TABLE 1. Overall characteristics of the examined YouTube videos.

Values	Mean	SD	Min	Max
Video length (min)	7.85	12	1.82	68.87
View count	1,224.8	3,260	17.61	21,535.11
Comment count	235	373	0	2,140
Like count	5.307	17.618	0	131.089
Dislike count	560.07	1,548.07	0	11,471
VPI (%)	81.19	21.19	0	97.71
Mean DISCERN score	30.5	8.1	18.5	53
Mean JAMA score	1.23	0.55	1	3

max, maximum; min, minimum; SD, standard deviation.

When the DISCERN scores given to the videos were evaluated, the mean DISCERN score given by Observer 1 was 30.4 ± 7.8 (min-max: 19–52) and 30.6 ± 8.4 (min-max: 18–54) by Observer 2. Accordingly, the mean DISCERN score of the two observers was calculated as 30.5 ± 8.1 . The mean DISCERN scale score was found to be 34.4 ± 7.4 for the YouTube videos uploaded by urologists and 26.6 ± 7.5 for those uploaded by non-physicians; the difference was statistically significant ($P < 0.001$). No statistically significant difference was found between videos containing real (29.3 ± 7.9) and animated (31.8 ± 7.5) images in terms of the mean DISCERN scores ($P = 0.268$).

When the JAMA scores given to the videos were evaluated, the mean JAMA score given by Observer 1 was 1.18 ± 0.48 (min-max: 1–3) and 1.28 ± 0.62 (min-max: 1–3) by Observer 2. Accordingly, the overall mean JAMA score of all YouTube videos on ED evaluated was calculated to be 1.23 ± 0.55 . The mean JAMA scale score was found to be 1.2 ± 0.41 for the YouTube videos uploaded by urologists and 1.15 ± 0.53 for those uploaded by non-physicians, and the difference was not statistically significant ($P = 0.645$). No statistically significant difference was found between videos containing real (1.16 ± 0.45) and animated (1.2 ± 0.54) images in terms of the mean JAMA scores ($P = 0.686$). Fig. 6 shows a comparison of the mean DISCERN and JAMA scores and the VPI index of the YouTube videos for physicians and non-physicians.

Spearman's correlation analysis was performed to evaluate the correlation between the observers. Very strong correlation and excellent compliance were observed between the

two urologists for the DISCERN scores ($r = 0.972$, $P < 0.001$, Cronbach α : 0.985) and for the JAMA scores ($r = 0.852$, $P < 0.001$, Cronbach α : 0.877).

Based on the mean DISCERN scores, overall quality was very poor in 24 (42.9%) of the examined videos, poor in 21 (37.5%), average in 10 (17.9%), and good in one (1.8%).

4. Discussion

Presently, there is heavy uploading of medical information to YouTube, one of the most popular social media platforms on the internet, by patients, physicians, and healthcare organizations alike. This activity is not limited to healthcare professionals, and currently YouTube has no regulatory mechanism for health-related content. Anyone can upload limitless health-related videos to YouTube regardless of qualifications. Patients and their relatives utilize these videos to investigate treatment options and risks for disease, learn from the experiences of other patients, and direct decision making. However, the ability to upload limitless videos on YouTube free of charge and regulation regardless of qualification casts doubt on the quality, accuracy, and reliability of health-related videos on YouTube. Variable and uncontrolled information in these videos may mislead patients and impair the balance in the relationship between the patient and clinician in terms of information and knowledge [16]. This is even more important in urology practice, where some diseases are considered especially sensitive.

In recent years, there has been an increase in the professional evaluation of the accuracy and quality of healthcare content on YouTube. A systematic review by Drozd *et al.* [17] on the evaluation methods of YouTube medical videos found 1,089 studies measuring the quality of health-related YouTube videos in PubMed as of 2018. In the evaluation of the most-viewed videos on YouTube pertaining to ED, which is a common disease worldwide, the overall quality of the videos was found to be low according to the DISCERN and JAMA scores. Although the DISCERN scores of the videos uploaded by physicians were significantly higher than those of the videos uploaded by non-physicians, even the quality of the physician-uploaded videos was not sufficient for providing accurate and reliable information. According

to the DISCERN scale, among the YouTube videos uploaded by urologists, only one video was scored as “good”. Seven videos were “average”, 11 videos were “poor” and five videos were “very poor”. Similar to our study, Fode *et al.* examined 100 YouTube videos about ED and reported that only 21 of these videos were uploaded directly by physicians. The authors reported that the quality of the examined videos was very good in two, good in 16, average in 21, poor in 35, and very poor in 18 [12]. Given that many previously conducted studies have reported health-related YouTube videos to be of low quality, our findings are not surprising [18–20]. Accordingly, the poor quality of videos seems to be not limited to certain diseases.

In the study by Fode *et al.* [12], of the examined 100 videos, 42 were uploaded by hospitals and health organizations, 21 by physicians, and 37 by other users. In our study, 57% of the examined videos were uploaded by non-physicians. In the study by Ovenden *et al.* [21], a majority of the reviewed videos were uploaded by laypeople, with 46% including patient experience.

Gul *et al.* [22] evaluated the quality of YouTube videos containing information about premature ejaculation and found no statistically significant difference between the reliable and unreliable information groups. This indicates that the popularity of low-quality videos is higher than that of quality videos. Videos with high-quality content are usually uploaded by healthcare professionals, and their inclusion of some medical terms that ordinary people may not understand may contribute to the decreased popularity of these videos.

In the literature, there are studies evaluating YouTube videos as a source of information in various subjects in urology practice [10–12, 22–24]. In general, these studies have reported that the videos examined had misleading content. According to our results, the overall quality of YouTube videos on ED was not sufficient for providing reliable information, even in the videos uploaded by urologists, and the videos uploaded by non-physicians were more popular. In a medical field such as urology, where patients usually hesitate to seek professional medical help, directing them to inappropriate and/or unnecessary treatments with misleading and low-quality information increases the importance of the accuracy and reliability of health-related content on the internet.

4.1 Limitations

This study has some limitations. Our analysis was limited to English videos. YouTube videos were evaluated with only a single point in time. YouTube content changes over time. There is no clear consensus on how to evaluate health-related videos. Finally, the videos were evaluated by two experienced urologists, and patients' perceptions were not considered.

5. Conclusions

The results of this study indicated that the overall quality of YouTube content on ED was not sufficient for providing reliable information for patients. The internet and especially YouTube have the potential to provide patients with easy access to a large amount of information about ED. However, today, the majority of these resources are of low quality. Nevertheless, the educational potential of YouTube for patients cannot be ignored.

We recommend that, the physicians should warn patients about the limitations of YouTube and direct them toward more appropriate sources of information.

Author contributions

MYS designed and executed the study, analyzed and interpreted the results. OS collected and the data, interpreted the results and supervised the study.

Ethics approval and consent to participate

Since this study did not include human or animal subjects, ethics approval and consent to participate were waived.

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Conflict of interest

The authors declare no conflict of interest.

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