



Assessment of the educational value of undescended testicle operation videos on YouTube

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Abstract

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Aim: Today, Youtube, which is also used as a source of health information, is one of the most visited social platforms. The aim of this study was to evaluate the content and reliability of videos on undescended testicular operations for surgeons and parents.

Materials and Methods: On 25/9/2023, the keywords "undescended testicle operation," "orchiopexy," and "children" were searched on the YouTube search engine. The selected videos were divided into two groups: useful and misleading. In addition to the descriptive characteristics of the videos, the reliability, quality and content of the videos were analysed using the global quality score (GQS), modified DISCERN (mDISCERN), and video power index (VPI) score.

Results: Of the 62 videos evaluated in our study, 69.4% (n=43) were of high quality, 14.5% (n=9) were of medium quality and 16.1% (n=4) were of low quality. GQS and mDISCERN scores were higher in the useful group (p=0.002, p=0.001, respectively). While 91.1% (n=51) of the videos in the useful group were addressed to healthcare professionals (p=0.024), 78.6% (n=44) of these videos were uploaded by physicians. A positive correlation was observed between GQS and mDISCERN scores (p<0.001).

Conclusion: Videos uploaded by academicians, surgeons and addressed to health professionals were found to be reliable and of high quality. Undescended testicular operations videos uploaded to social platforms should be prepared by a committee with health professionals and checked for compliance with scientific standards.



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Introduction

Undescended testis is the most common urogenital anomaly in children and is found in approximately 1.1-2.1% of boys under 1 year old [1]. Although this anomaly is mostly unilateral, both testicles are affected in approximately 10% of patients. Hormonal therapy is sometimes used in the treatment of undescended testis, but the efficacy of this treatment is not certain, and unfavorable results may be encountered. Today, surgical treatment has taken precedence over hormonal treatment due to infertility, malignancy, testicular torsion, and accompanying inguinal hernia, and as a result, surgical treatment is the preferred method in the treatment of undescended testis [2,3].

The internet provides easy, cheap, and fast access to information for many people. With the developments in internet technologies, social media has become one of the

most basic sources of information for healthcare professionals, parents and patients [4,5]. YouTube, which is the second most popular website with 2.5 billion users in the world and a media-sharing site where users can upload, share, and comment on videos, is not only the most popular video platform but also the most frequently used educational video source for health education or as a source of information for their children by anxious parents [6,7].

We aimed to analyze the content, quality and scientific reliability of videos on undescended testicular surgery posted on the YouTube platform.

Materials and Methods

Video selection

In previous studies evaluating health videos on Youtube, the videos included in the study were obtained by entering keywords into the search engine on the relevant date and following the determined inclusion and exclusion criteria [8]. A search was performed on YouTube

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(www.youtube.com) using the keywords "undescended testicle operation," "orchiopexy," and "children" in the video search engine on 25/9/2023 and a total of 547 videos were accessed by checking the relevant tab in the filtering process. Since search results may change on different days, the resource locators (URLs) were backed up (25/9/2023). Videos with audio narration or explanatory subtitles in English and with duration between 2-90 minutes were included in the study. We excluded 485 videos that were broadcast in another language, did not have audio narration or informative subtitles, contained advertisements, had a video duration of less than 2 minutes or more than 90 minutes, were irrelevant and duplicates, and as a result, we included 62 videos out of 547 in the study (Figure 1). All reviews were assessed by two independent pediatric surgical experts with at least ten years of professional experience. Any differences between the surgeons were resolved by reassessment and reconciliation.

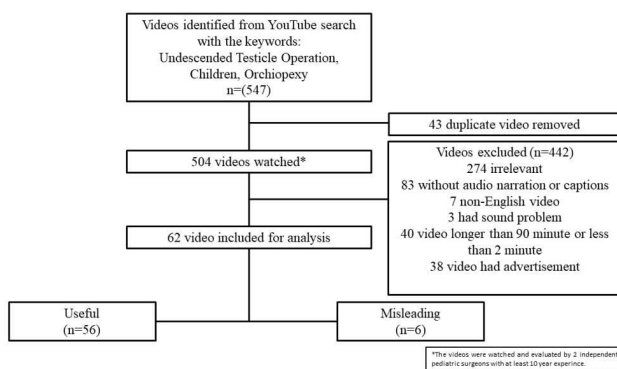


Figure 1. Flowchart showing the selection of YouTube videos on undescended testicular operations.

Video parameters

In the study, total number of views, the duration (minutes), number of comments, whether the video was open to comments or not, number of likes, the time elapsed since the day it was published on YouTube, number of subscribers, the number of daily views (total number of views/time elapsed since the day the video was published) were recorded. The videos were classified according to the video sources: doctors, academic institutions, and medical sources. The target audience of the video was determined to be health professionals or patients/parents. In addition, video content was categorized into five different categories: an overview of undescended testicular operations, laparoscopic undescended testicular operation (with audio narration), laparoscopic undescended testicular operation (with subtitles), open undescended testicular operation (with audio), open undescended testicular operation (with subtitles).

Evaluation of the videos

The video power index (VPI), used in many previous studies, was used to measure the popularity of uploaded videos [9]. Previously, the VPI formula was calculated as $(VPI = \text{number of likes} * (\text{view number} / \text{number of days after upload to the internet}) / 100)$ [10]. The Global Quality Score

(GQS) was devised to analyze the quality of internet-based resources [11]. The GQS allows the interpretation of the analyzed videos, ease of use, and usefulness according to the information flow to be evaluated on a five-point Likert scale. Scoring on this scale ranges from 1 to 5, and as used in similar studies: 1 and 2 scores state low, 3 scores states medium, and 4 and 5 scores state high video quality (Table 1) [11,12].

The modified DISCERN (mDISCERN) modified by Singh et al. is used to assess the visual media and information in YouTube videos and to assess the integrity and reliability of the information in the content. The dependability of the information in the video was scored between 1 and 5 [13].

Assessment of usefulness

In our study, we employed the classification of usefulness or misleading, which has been used to evaluate the usefulness of videos in previous studies [12,14]. Based on this classification, videos were evaluated as useful or misleading according to whether they contained scientific information about an aspect of the disease being evaluated (symptom, diagnosis, treatment, technique).

Statistical analysis

We used the SPSS v.24.0 program to analyze the data in the study. Shapiro-Wilk test was utilized to evaluate whether the data fit the normal distribution. Kappa test was used to evaluate the agreement between the two surgeons. Quantitative data that did not fit the normal distribution were expressed as median (25-75 Interquartile range- IQR). Mann-Whitney U test was conducted for pairwise comparisons of "useful" and "misleading" videos in terms of the number of views, number of likes, number of comments, duration time, number of daily views, upload time of videos, number of subscribers, mDISCERN score, GQS and VPI while we used the Chi-square and Fisher's exact test for the analysis of qualitative parameters such as sources, target audience, and video content. Kruskal Wallis test was used to compare the mDISCERN and GQS scores of video contents such overview, laparoscopic (voice), laparoscopic (subtitled), open surgery (voice) and Open surgery (subtitled). We assessed the association between two quantitative parametric variables using Pearson correlation. Statistical significance was determined with a threshold of $p < 0.05$.

Results

In our study, it was determined that 7 of the 547 videos found as a result of a YouTube search were in another language, 83 had no audio narration or explanatory subtitles, 40 had a duration of fewer than 2 minutes or more than 90 minutes, 38 had videos containing advertisements, 43 were duplicates, and 274 had irrelevant content and therefore, these videos were excluded. Of the 62 videos included in the study, 90.3% ($n=56$) were useful, and 9.7% ($n=6$) were misleading (Figure 1).

The median (25-75IQR) duration of the 62 videos evaluated was 7.22 (4.10-13.65) min in the useful group and

Table 1. Evaluation of video features, mDISCERN and GQS scores.

Variables	Useful n=56	Misleading n=6	p
Video features	MD(25-75IQR)	MD(25-75IQR)	
Number of views	6800 (1722-22316)	914 (169-31544)	0.273
Number of likes	70 (19-187)	13 (2-74)	0.113
Number of comments	6 (1-20)	1 (0-1)	0.076
Duration time (minute)	7.22 (4.10-13.65)	3.12 (2.17-7.38)	0.041^u
Number of per Daily views	6.53 (2.08-18.76)	0.86 (0.53-10.67)	0.243
Upload time of videos	1436 (605-2166)	1736 (232-2955)	0.868
Number of subscribers	2385(463-13500)	765 (266-6830)	0.341
Reliability and quality scores	MD(25-75IQR)	MD(25-75IQR)	
mDISCERN score	5 (4-5)	3 (2-3)	0.001^u
GQS	4 (4-5)	2 (2-3)	0.002^u
VPI	3.17(0.5050-32.75)	0.07(0.01-7.89)	0.153
Sources	n (%)	n (%)	
Academic institutions/Universities	5 (8.9%)	0 (0%)	
Physicians	44 (78.6%)	4 (66.7%)	0.268
Medical sources	7 (12.5%)	2 (33.3%)	
Target audience	n (%)	n (%)	
Health care professional	51(91.1%)	3 (50%)	
Patients/Parents	5 (8.9%)	3 (50%)	0.024*
Video contents	n (%)	n (%)	
Overview	12 (21.4%)	2 (33.3%)	
Open surgery (voice)	7 (12.5%)	0 (0%)	
Open surgery (subtitled)	6 (10.7%)	1 (16.7%)	0.517
Laparoscopic (voice)	21 (37.5%)	1 (16.7%)	
Laparoscopic (subtitled)	10 (17.9%)	2 (33.3%)	

*=Fisher's exact test was used, ^u=Mann Whitney U test was used, MD=Median, IQR=Interquartile Range, Statistical significant p-values are described as dark color punto.

Table 2. Comparison of the mDISCERN, GQS scores according to video contents.

	Overview n=14 (22.6%)	Laparoscopic (voice) n=22 (35.5%)	Laparoscopic (subtitled) n=12 (19.4%)	Open surgey (voice) n=7 (11.3%)	Open surgery (subtitled) n=7(11.3%)	p
mDISCERN	5 (2-5)	5 (4-5)	4(3-4)	5 (4-5)	5 (4-5)	0.03*
GQS	4 (3-5)	5 (4-5)	3 (2-4)	5 (3-5)	4 (4-5)	0.012*

*=Kruskal Wallis test was used for evaluating, Statistical significant p-values are described as dark color punto, mDISCERN and GQS values were shown as median (25-75IQR).

3.12 (2.17-7.38) min in the misleading group. This difference was statistically significant regarding video duration in both groups ($p = 0.041$). The median (25-75IQR) values of other video characteristics, such as the number of daily views, total views, likes, comments, and subscribers of the analyzed videos, are presented in Table 1.

When the content of the 62 videos included was analyzed, 22.6% ($n=14$) were overview videos, and 35.5% ($n=22$) were videos of laparoscopic undescended testicular operation with audio narration (Table 1). Four of the six videos of open undescended testicular operations with subtitles in the useful group were accompanied by audio narration. No statistical difference was observed between the useful and misleading groups regarding content ($p = 0.517$).

When the videos were evaluated in terms of the target audience addressed by the video content, it was observed that

91.1% ($n=51$) of the videos in the informative group were aimed at healthcare professionals and 8.9% ($n=5$) were aimed at patients/parents, while in the misleading group, these rates were 50% ($n=3$) and 50% ($n=3$), respectively ($p = 0.024$).

In the Useful and misleading groups, 78.6% ($n=44$) and 66.7% ($n=4$) of the videos were uploaded most frequently by physicians, respectively. No statistically significant differences were observed between the groups concerning video sources ($p = 0.268$).

When the video contents were evaluated with regard to mDISCERN and GQS scores, it was observed that the laparoscopic subtitled video group had lower GQS and mDISCERN scores than the other groups ($p = 0.03$, $p = 0.012$) (Table 2).

In our study, the Kappa score used to measure the agree-

Table 3. Correlation of video features, GQS, mDISCERN and VPI scores.

		Number of per daily views	Number of likes	Number of comments	Duration time	mDISCERN score	GQS score	VPI score
Subscriber numbers	Pearson Correlation	0.586**	0.601**	0.578**	0.172	0.252*	0.356*	0.588**
	Sig.(2tailed)	<0.001	<0.001	<0.001	0.181	0.048	0.016	<0.001
	N	62	62	50	62	62	62	62
Number of per daily views	Pearson Correlation	1	0.933**	0.762**	0.124	0.362**	0.365**	0.975**
	Sig.(2tailed)		<0.001	<0.001	0.335	0.004	0.004	<0.001
	N		62	50	62	62	62	62
Number of likes	Pearson Correlation		1	0.824**	0.201	0.334**	0.395**	0.979**
	Sig.(2tailed)			<0.001	0.118	0.008	0.001	<0.001
	N			50	62	62	62	62
Number of comments	Pearson Correlation			1	0.18	0.381**	0.386**	0.799**
	Sig.(2tailed)				0.211	0.006	0.006	<0.001
	N				50	50	50	50
Duration time	Pearson Correlation				1	0.386**	0.222	0.168
	Sig.(2tailed)					0.002	0.083	0.193
	N					62	62	62
mDISCERN score	Pearson Correlation					1	0.745**	0.35**
	Sig.(2tailed)						<0.001	0.005
	N						62	62
GQS score	Pearson Correlation						1	0.398**
	Sig.(2tailed)							0.001
	N							62

ment of the mDISCERN score between the two authors who evaluated the videos was 0.711. The median (25-75IQR) of the mDISCERN score used to evaluate the integrity and reliability of the information was calculated as 5 (4-5) in the useful group and 3 (2-3) in the misleading group ($p = 0.001$).

The Kappa value of the GQS score was calculated as 0.751. In the useful group, 75% ($n=42$) of the videos were found to be of high quality with respect to GQS scores. In the Misleading group, 66% ($n=4$) of the videos were low-quality. The GQS median (25-75IQR) was calculated as 4 (4-5) in the useful group and 2 (2-3) in the misleading group, and this disparity was statistically significant ($p = 0.002$). A strong correlation was found between the number of daily views of all videos and the number of likes ($r^2=0.933$ $p < 0.001$), comments ($r^2 = 0.762$, $p < 0.001$), and VPI ($r^2=0.975$, $p < 0.001$). There was also a strong correlation between mDISCERN and GQS scores ($r^2=0.745$ $p < 0.001$). The correlation analysis of the other features of the videos is shown in Table 3.

Discussion

To the best of our knowledge, this is the first study to investigate the quality and reliability of videos on undescended testicular operations on YouTube. We found that videos in the useful video group appealed to healthcare professionals ($p=0.024$), and video duration was significantly higher than in the misleading group ($p=0.041$). We found that useful videos had significantly higher mDISCERN and GQS scores ($p = 0.001$, $p = 0.002$, respectively). We also found a positive correlation between the number of

daily views of the video and comments and the number of likes ($r^2=0.762$ $p < 0.001$, $r^2=0.933$ $p < 0.001$, respectively).

With the increase in the use of the internet, YouTube has become a frequently used video-sharing site for doctors/parents to obtain information in the realm of health. However, the fact that the content of videos shared on this platform is not standardized, videos can be easily uploaded to the platform without a control mechanism, and some videos contain misleading or deceptive information about the subject, causes the video content to be questioned [15,16]. The audience addressed by health-related videos published on this platform can generally vary as healthcare personnel, patients, and parents, and also this information can be very effective on the target audience [17]. In a study [18] in which 40 YouTube videos were analyzed for each diagnosis related to pediatric surgical diseases such as gastroschisis, congenital diaphragmatic hernia, inguinal hernia, and pectus excavatum, only 20% of the videos were addressed to healthcare professionals, whereas 87% of the videos in our study were addressed to healthcare professionals ($p=0.024$). The fact that the information provided in videos about medical education or surgical operations is understandable and contains information for the target audience indicates the audience that the videos address.

There are still questions about video quality, accurate information and credibility on social media platforms that are frequently used by healthcare professionals, patients and parents. In an examination of 90 hysteroscopy videos evaluated separately by obstetricians and gynecologists, it was revealed that the mean mDISCERN and GQS scores

were below 3 points in both group evaluations, and it was determined that the fluency quality and reliability of the information presented were low [19]. In another study evaluating percutaneous nephrolithotomy videos, the quality and content of the videos were found as low quality [20]. In contrast, in a cross-sectional study evaluating the reliability and content of 115 YouTube videos on dialysis, it was observed that 58.3% of the videos were useful and similar to our study. These videos had significantly higher mDISCERN and GQS scores [16]. Similarly, in a study conducted by Demirtaş et al. [12] in which 55 YouTube videos on infantile colic in pediatric patients were included, quality and reliability scores were found to be higher in informative videos, and similar results were found in the study by Ng et al. [21]. In our study, mDISCERN and GQS scores of informative videos were found to be significantly higher ($p=0.001$). The high reliability and GQS scores indicate that YouTube videos in our study can be used as a useful source of information for viewers.

With the impact of the COVID-19 pandemic, social media has been rapidly integrated into the field of surgery and surgical education. Studies highlight that YouTube is among the most extensively utilized social media platforms for accessing videos related to surgery in addition to diagnosis and treatment of diseases [6,7]. It has been shown that 95% of surgical residency students prefer YouTube to watch operation videos [22]. In addition to the thought that the patient or parent can gain more awareness and relieve their concerns in a situation where an operation decision is made, the fact that they cannot get enough information about the operation in the limited outpatient clinic time causes YouTube to be used as an informative resource [23]. The research suggests that videos uploaded by academicians or physicians generally provide more accurate information. However, there is a suggestion that videos uploaded by individuals who are not health professionals may be biased, leading to potentially misleading information [14,16]. Since preserving testicular function and germ cells is important in undescended testicular operations [24], sharing high-quality videos produced by academic institutions and specialized physicians is of great importance. In our study, 78.6% of medical doctors constituted the highest percentage of video uploaders in the useful group. In our study, high quality videos were mostly uploaded by doctors and academicians ($p<0.001$). This result shows that surgeons use YouTube as an educational tool in undescended testicular operations and also, informative and educational videos about undescended testicular operations uploaded by academicians and specialists are more likely to be complete and accurate is noteworthy.

In our study, when the content of the videos was compared in terms of mDISCERN and GQS scores, we found that laparoscopic subtitled undescended testicular operation videos had the lowest scores ($p=0.03$, 0.012 respectively). Considering that four of the six open-captioned undescended testicular operation videos in the Useful group were accompanied by audio narration, it can be said that the presence of audio narration in the videos conveys information more accurately to patients and healthcare professionals and that healthcare professionals are more educative about performing this procedure. In studies in which

retrograde intrarenal and percutaneous nephrolithotomy operation videos were evaluated, it was found that only audio narration or accompanying audio narration with subtitles had positive effects on mDISCERN and GQS scores [20,25]. Therefore, videos prepared for this purpose must have English narration with audio for better quality and effectiveness.

For existing videos on YouTube, the total number of views, especially the number of daily views, is one of the important parameters indicating the popularity of the video [4,6,12]. Some studies have reported that popular health videos on YouTube contain misleading or incomplete information [26,27]. In our study, it was observed that videos that viewers could benefit from were frequently uploaded by physicians and had higher reliability and quality scores, but this did not have a significant effect on popularity indicators such as the number of views and daily views, likes, comments, and VPI. A remarkable finding in our study was that a strong correlation was found between the number of likes and the number of daily views of videos, comments, and VPI. This result may be a consequence of parents seeking information about undescended testicle operation, increasing the popularity of the video by frequently watching and sharing videos that are open to likes and comments, have low content quality, and contain misleading and incomplete information. Therefore, considering these effects, the overall and daily counts of views and likes should be carefully evaluated. In addition, a strong correlation was found between mDISCERN and GQS scores, indicating that the data are healthy and reliable.

There are different results on the effect of video length on the quality and usefulness of videos. In a YouTube study evaluating videos on laparoscopic cholecystectomy, it was observed that video length did not affect the usefulness or quality of the video [28]. In contrast, a study evaluating laparoscopic fundoplication videos found that the video duration was significantly longer in videos considered useful [29]. Our findings revealed that although general video characteristics such as total and daily views and likes were higher in the useful group, only video duration had a substantial impact on the usefulness of the video ($p=0.041$). We believe that as the duration increases, the explainability of the topic and the quality of the content increases. However, it is important not to ignore the risk of losing viewer interest and decreasing viewership of these longer videos.

Limitations

YouTube has a dynamic structure, and new videos are added, commented and watched, which may change search results over time. The data collection method is instantaneous is one of the limitations of the study. The other limitation of our study that only English-language video include to study.

Conclusion

The fact that health videos about undescended testicular operations on YouTube can be uploaded to the platform by anyone without the need for prior review, approval of appropriateness, or credibility may expose patients and parents to misleading information or may lead to mislearning

by surgical residents. For these reasons, despite its high usage rate, YouTube needs to be reviewed for its quality, effectiveness, and usefulness by a peer review board including healthcare professionals.

Ethical approval

Since this study was not a study on patients or animals, ethics committee approval was not obtained. The information was open to the public, and there was no need to obtain ethics committee approval in previous similar studies [10,12].

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