Are HoLEP Surgical Videos on YouTube Biased and Misleading or Are They Leading the Industry?

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What's known on the subject? and What does the study add?

Social media platforms are popular areas for sharing surgical skills and techniques, and presenting healthcare information. Additionally, the rate of patients receiving information about health by using search engines such as google and social media platforms increased due to the proliferation of mobile phones and the Internet. The studies emphasized that there is a spread of false information concerning urological conditions on these platforms. In addition, the published literature showed that the videos that did not contain accurate information were viewed more than informative videos. Video-sharing websites such as YouTube do not evaluate the misinformation in videos, especially in the field of health. There is no study evaluating the information sources of patients with benign prostatic hyperplasia. Our study showed that most of the videos related to holmium laser enucleation of the prostate surgery were uploaded by healthcare providers and the misinformation rate was significantly higher in videos uploaded by the industry. Our study suggests that the videos posted on presenting accurate and reliable information about disease videos should be allowed to be published after the approval of institutions such as healthcare associations and universities.

Abstract

Objective: In this study, we aimed to evaluate the content and quality of the most relevant YouTube videos related to holmium laser enucleation of the prostate (HoLEP) surgery.

Materials and Methods: The keywords "HOLEP", "laser enucleation" and "prostate enucleation" were used to perform a search on YouTube. Non-English language videos, videos with less than 4-minute duration, and repetitive videos were excluded. The reactions of the viewers to the videos were evaluated by recording the "total views", "views/month" and "likes and dislikes" parameters. The data were divided into two groups based on the source of upload: Group 1 consisted of healthcare providers and group 2 comprised of commercial companies and for-profit organizations.

Results: A total of 117 videos were included in the study. A significant portion of the videos (77.7%) had been uploaded by healthcare providers. There was no statistically significant difference between the uploading groups in terms of the DISCERN and the Global Quality score, scores (p=0.484 and p=0.108, respectively). However, Patient Education Materials Assessment Tool for Audiovisual Materials understandability and actionability scores were statistically significantly higher in group 2 (p=0.004 and p=0.022, respectively). In addition, when the misinformation scale was evaluated, there were significantly more videos with high-degree misinformation in group 2 (5.5% vs 33.3%, p=0.001).

Conclusion: On video sharing platforms, such as YouTube, the number of reliable videos with accurate and appropriate guidance about diseases and treatments should be increased, and these videos should be allowed to be posted after they have been approved by relevant institutions, including healthcare associations and universities.

Keywords: HoLEP, patient information, social media, YouTube

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Introduction

Benign prostatic hyperplasia (BPH) begins to be seen after the age of 40 years, and its incidence increases with age, reaching 80-90% among the population aged 70 to 80 years (1). Surgical treatment is applied in symptomatic BPH cases that do not benefit from medical treatment and/or develop complications. There are many surgical alternatives to surgically treat symptomatic BPH [open prostatectomy, transurethral resection of the prostate, transurethral enucleation of the prostate, holmium laser enucleation of the prostate (HoLEP), etc.]. Among these surgical procedures, HoLEP has taken its place as a surgical treatment option of BPH due to its efficacy and safety in large prostates (2). It has been shown that full enucleation performed after HoLEP results in reduced possibility of repeat surgery, less bleeding, and decreased hospital stay due to the shorter duration of catheter use (3). For these reasons, HoLEP surgery has started to be preferred frequently, and its popularity is gradually increasing.

Video content providers allow patients to easily access information on various treatment methods, which can affect their treatment decisions. YouTube is one of the most popular video-sharing platforms, having more than 1 billion users who collectively watch more than 1 billion hours of videos every day (4,5). Unfortunately, information pollution caused by inaccurate information spreading through social media tools is a very important issue. Therefore, it is important to ensure the accuracy, reliability and understandability of online information obtained from patients concerning treatment methods. In previous studies, it has already been emphasized that there is a spread of false and/or biased information concerning urological conditions on YouTube (6,7). Besides, it can be difficult for patients to distinguish the accuracy of the content of existing from the marketing promises of the informing party.

To the best of our knowledge, there is no study in the literature evaluating HoLEP-specific surgical videos on YouTube. Therefore, we evaluated the content, reliability and quality of the most relevant YouTube videos related to HoLEP surgery.

Materials and Methods

Search Strategy and Video Inclusion Criteria

The keywords "HoLEP", "laser enucleation" and "prostate enucleation" were used to conduct a search on YouTube (http://www.youtube.com) on December 16, 2020, without using any search filter. To reduce bias, all researchers performed the search by clearing their browser's search history and disabling their location status. As the exclusion criteria for the study, videos shorter than 4 minutes, repetitive videos, those with irrelevant content (advertisements, patient references, slide-

based presentations, and lectures) and non-English language videos were excluded from the study. A total of 1,416 videos were screened, and 1,156 videos were excluded from the study because they were non-English, irrelevant, or non-audio. Further 143 videos were excluded due to duplication. Thus, the number of videos that were eligible was 117 (Figure 1).

Video Parameters and Scoring System

The videos included in the study were watched by two independent surgeons, both specialized in endourology. In case of inconsistent evaluation between the two surgeons (non-matching results), a third physician evaluated the videos. In addition, the reactions of the viewers to the videos were assessed by recording the parameters of total views, views/month, and video likes and dislikes. The data were divided into two groups based on the source of upload: Group 1 consisted of healthcare providers (doctors, universities, academic journals, university or non-profit physicians, or professional organizations) and group 2 comprised commercial companies or for-profit organizations. The presence or absence of commercial bias was evaluated as described by Cornish and Leist (8). The degree of misinformation was assessed with reference to currently available evidence on surgical BPH treatment as reported using the EAU guidelines (9). In addition, we rated the extent of misinformation in the videos based on a Likert scale of 1 to 5 ("none", "low", "moderate", "high" and "extreme") (10). All videos were systematically evaluated using the Patient Education Materials Assessment Tool for Audiovisual Materials (PEMAT) and the validated DISCERN quality criteria (11-13).

PEMAT is a systematic method developed to select printable and audiovisual patient education materials, which are easier to understand and easier to act on. We used the version for audiovisual materials, which consists of 13 items measuring understandability and four items measuring actionability. The PEMAT provides two scores for each material-one for understandability and a separate score for actionability. Every item had a 1 point (agree) or 0 points (disagree) and N/A was not included in the calculation. Scores were multiplied by 100 to give a percentage score for understandability and actionability. There was no set cut-off value for the scores.

DISCERN is a standardized index of quality of consumer health information on treatment choices, which can be used by anyone without the need for specialist knowledge. The questionnaire consists of a total of 15 items plus an overall quality rating, with each item representing a separate quality criterion rated from 1 to 5 points (1-2 points: low; 3 points: moderate; and 4-5 points: high quality). Thus, a total score of 80 points is possible, with higher scores indicating higher quality. For the purposes of this study, we rated the videos using all relevant items and gave

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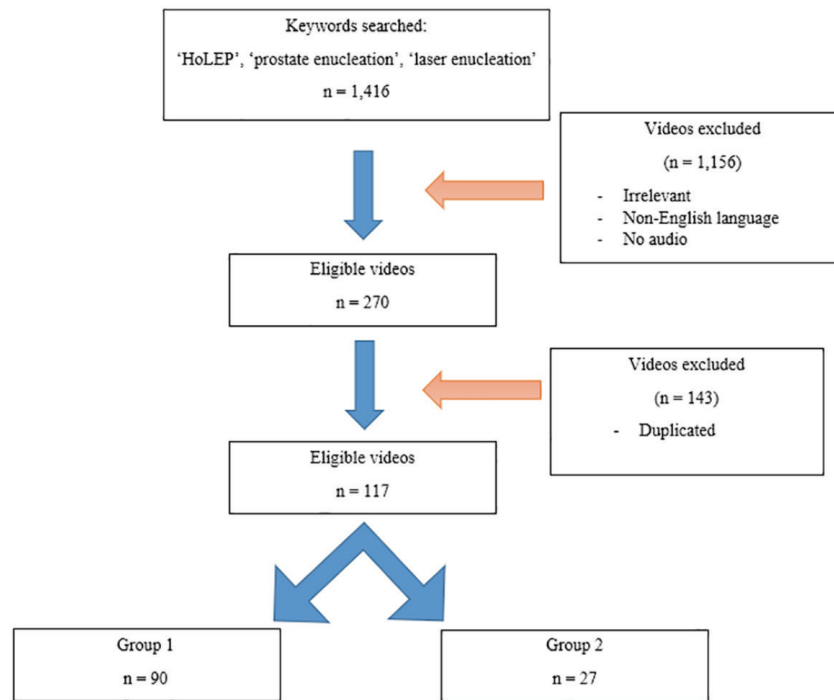
Figure 1. Selection of eligible YouTube videos for the study

them an overall quality rating although not all the videos were directly concerned with treatment choices.

To determine the overall quality of the videos, the Global Quality score (GQS), a five-point scale, was used (GQS: 1=poor quality; 5=excellent quality). This tool measures the accessibility quality and overall flow of the information contained within a video (14).

JAMA is a scoring system with a total of 4 points scored by evaluating whether the authors, institutions, references and sources are clearly stated in the video, whether there is information about copyright, whether there is any clear conflict of interest, and whether the dates of uploading and publication are clearly given (15).

Statistical Analysis

The Statistical Package for the Social Sciences (SPSS) for Windows, version 23.0 was used for evaluating the data. The Shapiro-Wilk test was used to determine the normality of distribution. Continuous variables were expressed as median and ranges, and their statistical analysis was performed using the Mann-Whitney U test. Categorical variables were expressed as numbers and percentages and analyzed using the chi-square test. Differences were considered statistically significant when the p-value was <0.05.

Results

A total of 117 videos were included in the study. The median time since upload was 24.00 (range=8.00-53.00) months. The median length of the videos was 14.10 (range=6.59-30.03) minutes. The median number of views was 590.50 (range=144.00-2674.00). A significant portion of the videos (n=94, 77.7%) had been uploaded by healthcare providers. Although the videos generally focused on surgeons (number of videos=72, 61.5%), there were 45 (38.5%) videos targeting the general audience. Table 1 shows the characteristics of the videos. When the videos were evaluated according to the questionnaires, although the viewing rates differed according to the DISCERN groups, the increase was not linear. When GQS was evaluated, the median values for the number of views, views per day and likes increased in the videos with a GQS of >3 (p=0.019, p=0.019, and p=0.009, respectively). There was no significant change in the discern score by years (p=0.466).

When the data were divided into group 1 and group 2 according to the upload source, the median number of views was 643.50 (range=155.00-2331.00) and 520.00 (range=181.00-8547.00), respectively, indicating a slightly higher value for healthcare providers, albeit with no significant difference (p=0.916) (Table 2). There was no statistically significant difference between the upload source groups in terms of the median number of views (per day), median number of likes, reliability score, DISCERN

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Table 1. Characteristics of the videos	
	Value
Duration (months)[a]	24.00 (8.00-53.00)
Video length (minutes)[a]	14.10 (6.59-30.03)
Total number of views[a]	590.50 (144.00-2674.00)
Number of views per day[a]	0.87 (0.18-3.43)
Number of comments[a]	0 (0.00-2.00)
Number of likes[a]	5.00 (1.00-16.00)
Number of dislikes[a]	0.00 (0.00-1.00)
Misinformation score[a]	3.00 (2.00-4.00)
LIKERT scale[a]	3.00 (2.00-4.00)
GQS score[a]	4.00 (3.00-4.00)
JAMA score[a]	2.00 (1.00-2.00)
PEMAT[a]	
Understandability	80.00 (64.29-93.33)
Actionability	75.00 (50.00-100.00)
DISCERN group	
Low	11 (9.3%)
Moderate	29 (24.7%)
High	77 (65.7%)
GQS group	
GQS 1	1 (0.9%)
GQS 2	15 (12.8%)
GQS 3	28 (23.9%)
GQS 4	58 (49.6%)
GQS 5	15 (12.8%)
Misinformation[b]	
Severe	1 (0.8%)
High	14 (11.9%)
Moderate	39 (33.3%)
Low	38 (32.4%)
None	15 (12.8%)
Intended audience[b]	
Surgeon	72 (61.5%)
General	45 (38.5%)
Information presented by[b]	
Doctor	99 (85.3%)
Healthcare	5 (4.3%)
Industry	5 (4.3%)
Other	8 (6.1%)
Discussion of alternative treatment options[b]	
Absent	74 (63.2%)
Exist	43 (36.8)
Are side effects mentioned in the video?[b]	
Absent	64 (54.7%)
Exist	53 (45.3%)

Table 1. Continued	
	Value
Surgical benefits[b]	
Absent	5 (4.3%)
Exist	112 (95.7%)
Commercial bias[b]	
Absent	51 (43.6%)
Exist	66 (56.4%)
Depiction of real surgery[b]	
None	9 (7.7%)
Exist	108 (92.3%)
[a]Data expressed as median and range	
[b]Data expressed as number and percentages	
GQS: Global quality score, PEMAT: Patient Education Materials Assessment Tool for Printable Material	

scores, and GQS of the videos (p=0.470, p=0.163, p=0.249, p=0.484, and p=0.108, respectively). However, when PEMAT was evaluated, the understandability scores [group 1=73.33 (range=60.00-92.86) and group 2=93.33 (range=80.00-100.00)] and actionability scores [group 1=75.00 (range=50.00-100.00) and group 2=100 (range=50.00-100.00)] were statistically significantly higher in group 2 (p=0.004 and p=0.022, respectively). Furthermore, according to the results of the misinformation scale, group 1 had uploaded more videos with low-degree misinformation [group 1=31 (34.4%)] and group 2=7 (25.9%)] while group 2 was the source of more videos with high-degree misinformation [group 1=5 (5.5%) and group 2=9 (33.3%)]. There was a statistically significant difference between the two groups in terms of misinformation evaluation (p=0.001).

Discussion

In this study, we evaluated the quality of YouTube videos on HoLEP that has gained popularity as a frequently preferred surgical method for BPH. The huge video archive on YouTube naturally consists of a large number of video content that examines each subject or topic from different perspectives. However, available evidence has shown that patients can be exposed to low-quality, biased, and/or commercial videos, which can lead to dangerous consequences (7,16). Therefore, it is important to evaluate the reliability and quality of YouTube videos that provide health information. Platforms such as YouTube allow patients to easily obtain information about the issues in which they are interested. However, based on the information presented here, patients can also make poor decisions or resort to expensive treatments. Nevertheless, the literature shows the increasing viewing of videos about the health field among patients or healthcare professionals (17).

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Table 2. Comparison of the video data between the upload source groups			
	Group 1 (Healthcare) (n=90)	Group 2 (Profit organizations) (n=27)	p-value
Video length (minutes)[a]	14.38 (7.22-32.15)	13.22 (5.54-20.00)	0.517
Total number of views[a]	643.50 (155.00-2331.00)	520.00 (181.00-8547.00)	0.916
Number of views per day[a]	1.23 (0.33-3.54)	0.76 (0.15-2.81)	0.470
Number of comments[a]	1.00 (0.00-3.00)	0.00 (0.00-0.00)	**0.038**
Number of likes[a]	7.00 (2.00-18.00)	2.00 (0.00-18.00)	0.163
Number of dislikes[a]	0.00 (0.00-1.00)	0.00 (0.00-1.00)	0.891
Reliability score[a]	3.38 (2.75-3.88)	3.38 (2.75-3.75)	0.249
DISCERN score[a]	4.0 (3.0-4.0)	4.00 (3.00-4.00)	0.484
GQS[a]	4.0 (3.0-4.0)	3.00 (3.00-4.00)	0.108
JAMA score[a]	2.0 (1.0-3.0)	2.00 (1.00-2.00)	0.818
JAMA group[b]			
JAMA score <2	68 (75.5%)	20 (74.1%)	0.859
JAMA score >2	22 (24.5%)	7 (25.9%)	
PEMAT[a]			
Understandability	73.33 (60.00-92.86)	93.33 (80.00-100.00)	**0.004**
Actionability	75.00 (50.00-100.00)	100 (50.00-100.00)	**0.022**
Misinformation degree[b]			
Extreme	1 (1.1%)	0 (0.0%)	0.001
High	5 (5.5%)	9 (33.3%)	
Moderate	32 (35.5%)	7 (25.9.0%)	
Low	31 (34.4%)	7(25.9%)	
None	11 (12.2%)	4 (14.8%)	
[a]Data expressed as median and range [b]Data expressed as number and percentages GQS: Global quality score, PEMAT: Patient Education Materials Assessment Tool for Printable Materials			

Depending on the upload source of surgical videos on YouTube, the message conveyed to the viewer and its reliability may vary. In a study by Huang et al. (18), it was found that the videos that did not contain accurate information were viewed more and received more comments. In our study, regardless of the upload source, we observed that 16.2% had extreme- or high-degree misinformation while commercial bias was present in 55.7%. In addition, it was observed that complications and alternative treatments were not mentioned in most of the videos. In a review, it was emphasized that most of the health-related YouTube videos present inaccurate and unreliable information (19). The literature indicates that this misinformation is not necessarily caused by a source being inappropriate or having insufficient expertise, and it could actually be intentional (20). Therefore, we consider that surgical videos on YouTube may pose more of a threat than guidance for patients seeking information to make a treatment decision.

There is no study has evaluated the information sources of patients with BPH; therefore, it is not precisely known how the videos posted on video-sharing sites reflect on or affect patients. In previous studies, it was emphasized that the videos uploaded by universities or healthcare institutions provided more comprehensive information and had higher quality (21,22). In a study by Gul and Diri (23), the videos were classified as those containing reliable and unreliable information, and the GQS and reliability scores were found to be statistically higher in the former. In addition, the authors showed that the majority of videos containing reliable information had been uploaded by for-profit companies. In our study, 23.0% of the total videos had been uploaded by group 2. We attribute these differences to the variations in the subjects discussed in the videos. In our study, no significant difference was observed in the DISCERN, GQS and JAMA scores between the upload source groups. There was also no difference between the two groups in relation to the total number of views, likes and dislikes. A previous study-compared videos as useful and misleading, and in contrast to our findings, the authors reported the comprehensiveness score of GQS to be statistically significantly higher in useful videos (24). In the same study, when the data were compared according to the upload source, the GQS, misleading information and

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comprehensiveness scores were found to be statistically higher for the videos uploaded by for-profit companies (24). In contrast, in our study, we also evaluated the videos using JAMA, PEMAT and Likert scales and found that the PEMAT and misinformation scores were higher in the videos uploaded by group 2. In a study by Fode et al. (25) to evaluate videos containing medical information, the median PEMAT understandability score was found to be 100% (range 50-100) and the median PEMAT actionability score was 100% (range 33-100). The results of multivariate regression analysis revealed that all parameters of videos uploaded by medical institutions had a statistically significant effect on the DISCERN rating (25). In our study, the PEMAT scores differed according to the upload source of the videos. The understandability and actionability scores of the videos uploaded by group 2 were statistically significantly higher compared to group 1. Furthermore, although there was misinformation in both groups, the number of videos with high-degree misinformation was significantly higher in group 2. We consider that the videos uploaded by group 2 aim to encourage or direct patients to undergo HoLEP surgery, which is a new and expensive treatment. In addition, in the study by Fode et al. (25), it was emphasized that there was no barrier and/or restriction when uploading content to websites, especially in the field of health (25). Our study shows that people watch these videos without distinguishing between poor and good content, or they may even not know how to make such a distinction. Thus, the videos they watch can direct them to a wrong treatment or misinformation. The PEMAT score also showed that these videos were easy to understand. Although the easy understandability of a video is a favorable characteristic, misinformation contained in some videos can have further negative effects on viewers. The subject of misinformation has been previously investigated and findings similar to our study have been presented by many studies.

Our findings highlight the importance of high-quality videos that objectively cover all spectrums of a treatment modality and can explain it in a way that patients can understand. High-quality information platforms are available (26). In addition, urology associations should be encouraged to upload high-quality and easy-to-understand videos to websites such as YouTube, where patients can research their diseases and treatment options.

Videos from a single video-sharing platform (YouTube) were viewed; however, since YouTube is an ever-evolving website, the evaluation of videos at a single time point may not accurately reflect what patients view after this initial search. By excluding non-English language videos, we may have further reduced the generalizability of our findings. Our study did not include videos available on other online video platforms such as Vimeo or those posted on academic department websites that may not be available on YouTube due to license agreements. Another

limitation of the study can be considered the inability to obtain the demographic characteristics of video viewers. There is still no complete consensus on how to fully evaluate health-related online videos.

Conclusion

YouTube is one of the popular platforms for presenting healthcare information and developing skills. Considering these results, it is important to evaluate viewers' behavior according to video uploaders. Therefore, safe, unbiased, and high-quality HoLEP surgery videos should be uploaded cautiously and should take into consideration that patients and healthcare professionals who are viewing them. The number of videos posted on video-sharing websites such as YouTube presenting accurate and reliable information about diseases and treatments should be increased, and these videos should be allowed to be published after the approval of institutions such as healthcare associations and universities. We believe that further studies in urology and other medical fields will contribute to the quality and reliability of health-related video content.

Ethics

Ethics Committee Approval: Some studies that do not require ethical approval include those involving information freely available in the public domain.

Informed Consent: Not necessary.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: S.G., Design: Ö.K., S.G., Data Collection or Processing: E.Y., H.S., N.T., S.P., B.K., F.U., S.G., Analysis or Interpretation: Ö.K., F.G., S.G., Literature Search: Ö.K., F.G., E.Y., H.S., S.P., B.K., F.U., S.G., Writing: Ö.K., F.G., S.G.

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