

ORIGINAL ARTICLE

Medicine Science 2023;12(3):674-9

Navigating the depths of digital knowledge: Assessing the seas of YouTube for reliable and high-quality information on appendicitis

Ali Muhtaroglu¹, Furkan Ali Uygur¹, Kayhan Ozdemir²¹Giresun University, Faculty of Medicine, Department of General Surgery, Giresun, Türkiye²Sakarya Training and Research Hospital, Department of General Surgery, Sakarya, Türkiye

Received 11 May, 2023; Accepted 22 July, 2023

Available online 19.08.2023 with doi: 10.5455/medscience.2023.05.065

Copyright@Author(s) - Available online at www.medicinescience.org

Content of this journal is licensed under a Creative Commons Attribution-NonCommercial-NonDerivatives 4.0 International License.



Abstract

Acute appendicitis is one of the most common diseases treated with surgical methods worldwide. This study evaluated the reliability and quality of YouTube video content about appendicitis. To evaluate the reliability and quality of YouTube videos related to appendicitis, this study analyzed the top 100 videos on the subject. The collected data included various characteristics such as image type, video content, length, total views, and engagement metrics such as likes, comments, and daily thoughts. The videos were divided into two groups based on the uploader: those uploaded by physicians and those uploaded by non-physicians. To assess the videos' reliability, the study employed the modified DISCERN tool, which evaluates the source's credibility and the accuracy and completeness of the information provided. Additionally, the study utilized the Global Quality Scale (GQS) to assess the quality of the videos based on various criteria such as clarity, accuracy, and educational value. The mean video length was 12.0±30.49 minutes. The image type was animation in 10 (10%) videos, presentation in 15%, and real in 75%. There was no statistically significant difference between the groups regarding the video characteristics ($p>0.05$). The mean DISCERN and GQS scores were statistically significantly higher in the physician group than in the non-physician group ($p<0.05$). There was an excellent agreement between the two general surgeons in terms of the DISCERN and GQS scores. Both DISCERN and GQS scores, namely reliability and quality, were higher in YouTube videos uploaded directly by physicians. In addition, DISCERN and GQS scores were higher in the animated and educational videos. Most videos were of good reliability and quality, which might reflect the specificity of the search topic.

Keywords: Anticholinergic burden score, polypharmacy, comorbidities, length of stay, older adults

Introduction

In today's digital age, online platforms have become go-to sources of information for individuals seeking insights on various topics, including healthcare. Among these platforms, YouTube stands out as a dominant force, providing a vast collection of videos that cover an extensive range of subjects. With millions of hours of content uploaded daily, YouTube has become a treasure trove of information, offering educational and entertainment resources. However, the general nature of user-generated content

on YouTube raises concerns about the information's accuracy, reliability, and quality. In medical knowledge, it becomes crucial to assess the credibility of online resources to ensure that accurate and trustworthy information reaches those seeking it. This necessity is particularly true for acute appendicitis, a prevalent ailment requiring surgical intervention.

Acute appendicitis is a common and time-sensitive medical condition characterized by inflammation of the appendix. It requires prompt diagnosis and surgical intervention to prevent

CITATION

Muhtaroglu A, Uygur FA, Ozdemir K. Navigating the depths of digital knowledge: Assessing the seas of YouTube for reliable and high-quality information on appendicitis. Med Science. 2023;12(3):674-9.



Corresponding Author: Ali Muhtaroglu, Giresun University, Faculty of Medicine, Department of General Surgery, Giresun, Türkiye
Email: alimuhtaroglu@gmail.com

complications. Symptoms include severe abdominal pain, loss of appetite, nausea, vomiting, and occasionally a low-grade fever. The primary treatment is surgical removal of the appendix through an appendectomy [1,2]. Recognizing the significance of accessible medical information, many physicians and non-physicians alike have taken to YouTube as a platform to share their expertise, personal experiences, and insights regarding appendicitis. However, the reliability and quality of such videos remain a matter of concern.

To shed light on the subject, this study evaluates the reliability and quality of YouTube videos related explicitly to appendicitis. By critically assessing the characteristics of these videos, including their content, duration, views, and uploaders, we aim to distinguish between medically authoritative sources and those lacking in reliability. We categorize the videos into two groups based on whether physicians or non-physicians uploaded them to explore any potential disparities in accuracy and quality.

To assess the reliability of the videos, we employ the modified DISCERN tool, a validated instrument designed to evaluate the quality of patient information in online resources. Additionally, we utilize the Global Quality Scale (GQS) to measure the overall quality of the videos. By employing these rigorous evaluation methods, we endeavour to comprehensively analyse the credibility and informational value of YouTube videos on appendicitis [3,4].

As we delve into the evaluation process, we anticipate uncovering insights into the various aspects contributing to these videos' reliability and quality. By elucidating the discrepancies between videos uploaded by physicians and non-physicians, we can highlight the importance of relying on verified sources of information while navigating the vast YouTube landscape. Furthermore, the findings of this study will aid healthcare professionals, patients, and individuals seeking knowledge by guiding them toward trustworthy, accurate, and informative content about appendicitis [6-8].

Ultimately, this research aims to contribute to the ongoing discourse on evaluating the credibility of online health information, promoting a more informed approach to sourcing medical knowledge and encouraging content creators to produce reliable and high-quality videos. By establishing a foundation for understanding the intricacies of YouTube's medical landscape, we endeavour to equip individuals with the tools needed to make informed decisions about their health and well-being [9,12].

Materials and Methods

Two general surgeons conducted this cross-sectional, observational study on 4-5 May 2023. Ethics committee approval was not needed because the videos were publicly available and did not include human or animal subjects. In the literature, similar YouTube studies had no ethical approval either [13,14].

It is known that most internet users tend to view the first results [15]. Therefore, we decided to include the top 100 YouTube

videos related to appendicitis. The terms “appendicitis” and “acute appendicitis” were chosen by consensus of the two surgeons as the search terms. From the filtering feature of YouTube, we decided on “relevance”, which is the default option for filtering the results. We found a total of 613 YouTube videos concerning appendicitis. All videos were selected in English as it is the universal language of medical literature. Non-English videos, shorts, duplicate videos, no audio videos, ads, and irrelevant videos were excluded. From the remaining 377 videos, we entered links of the top 100 videos to Microsoft Excel software. The inclusion of the videos is shown in Figure 1.

The descriptive characteristics of the videos were collected included image type (actual, animation, presentation), uploaders (physicians, news channels, patients, hospital channels, herbalists, health channels), video content (education, general info, examination, treatment, appendectomy, patient experience, news), video length, total views, upload date, days since upload, daily thoughts, comment and like counts. The formula found Daily view count ([view date – upload date/total views]). The videos were divided into two groups: those uploaded directly by physicians and those uploaded by non-physicians. The Videos uploaded by news channels, patients, hospital channels, herbalists, and health channels were assigned to the non-physician group. The data collected were compared between these two groups.

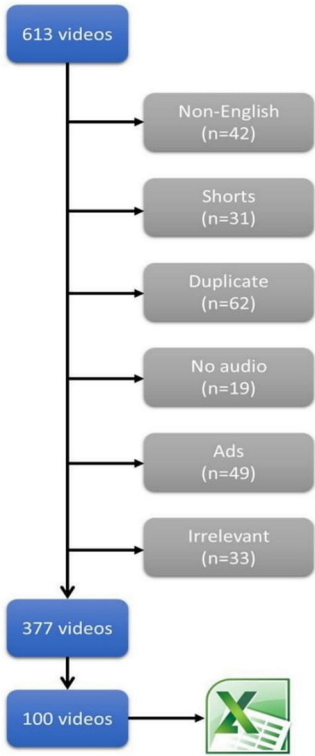


Figure 1. Inclusion flowchart of the YouTube videos related to appendicitis

Evaluation of the videos

The GQS is a scoring system specifically developed to evaluate the overall quality of health-related videos on online platforms

like YouTube. It provides a structured approach to rate the videos based on various criteria such as information accuracy, presentation clarity, visual aids, and overall educational value. The GQS assigns scores on a scale ranging from 1 to 5, with a higher score indicating better quality. By employing the GQS, this study aims to quantify the overall excellence of the videos and compare their relative quality [16].

On the other hand, the DISCERN tool is a modified version of the Quality Criteria for Consumer Health Information, designed to evaluate the reliability of health information resources intended for patients and consumers. It focuses on assessing the source's credibility, the balanced presentation of information, and the inclusion of additional sources of support or advice. The DISCERN tool allows reviewers to assign scores on a scale of 1 to 5, with higher scores indicating more excellent reliability. By utilizing the DISCERN tool, this study aims to determine the trustworthiness and reliability of the YouTube videos under scrutiny [17].

These standardized tools enable a systematic evaluation process, providing a quantitative measure of the quality and reliability of the videos. By assigning scores within a specific range, the GQS and DISCERN tool allows for consistent and comparable assessments, facilitating meaningful comparisons between videos and their uploaders. The items of GQS and the modified DISCERN tool are shown in Figure 2.

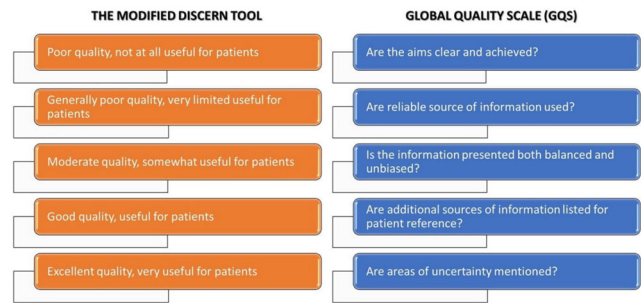


Figure 2. GQS scale and the modified DISCERN tool

Statistical analysis

Data obtained in this study were subjected to statistical analysis using the SPSS v25.0 (Statistical Package for Social Sciences, IBM Inc., Armonk, NY, USA) statistical software. The normality of the variables was evaluated using the Kolmogorov-Smirnov test. An Independent sample test was used to compare continuous variables and Chi-square for categorical variables between two groups. The continuous variables are expressed as mean±standard deviation, while categorical data are presented as frequency (n, %). p<0.05 values were considered statistically significant. In addition, an inter-rater agreement between the DISCERN and GQS scores was also evaluated using Cronbach α coefficient.

Results

The top 100 YouTube videos related to appendicitis and acute appendicitis according to the ‘relevance’ option were included

in the analysis. The total video length was 19.99 hours, and the mean video length was 12.0±30.49 minutes. The image type was animated in 10 (10%) videos, presentation in 15 (15%) videos and real in 75 (75%) videos (Figure 3).

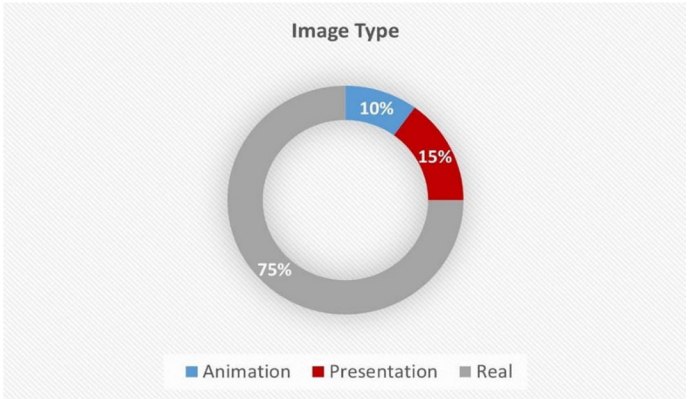


Figure 3. Distribution of the videos according to the image type

Of the 100 videos, 50 (50%) were uploaded directly by physicians, 36 (36%) by health channels, 7 (7%) by hospital channels, 4 (4%) by patients, 2 (2%) by herbalists and 1 (1%) by news channels (Figure 4).

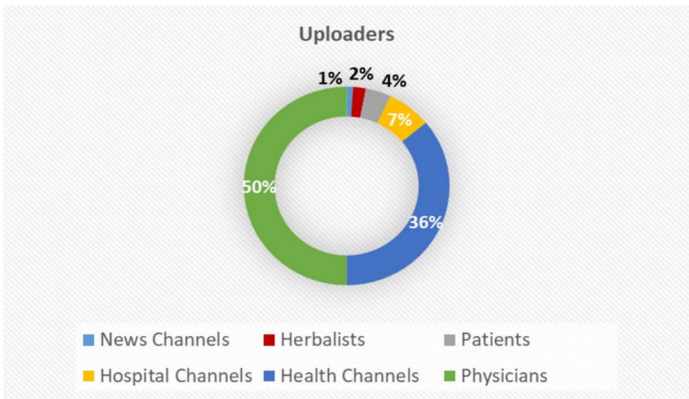


Figure 4. Distribution of the videos according to the uploaders

Content of the reviewed YouTube videos was found as general info in 32 (32%) videos, appendectomy in 23 (23%) videos, education in 21 (21%) videos, exam in 7 (7%) videos, treatment in 7 (7%) videos, patient experience in 5 (5%) videos and imaging in 2 (2%) videos (Figure 5).

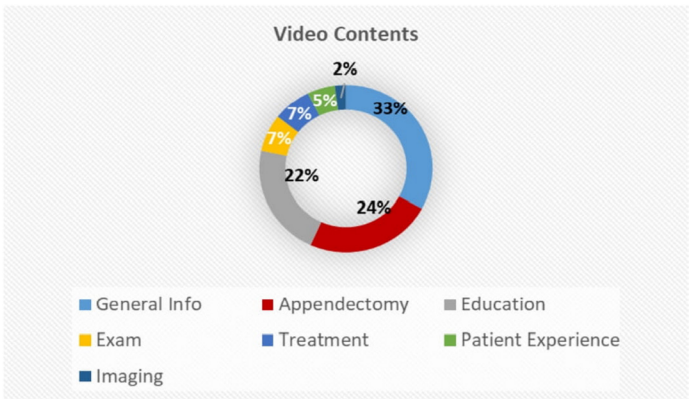


Figure 5. Distribution of the videos according to the content

The 100 videos were divided into two groups: those uploaded directly by physicians (n=50) and those uploaded by non-physicians. The oldest video was uploaded on 5 May 2012, and the newest one on 2 April 2023. A health channel about appendectomy uploaded the most viewed video, with a total view of 8.900.000 (Figure 6). Characteristics of the videos according to the groups are given in Table 1. There was no statistically significant difference between the groups regarding the video characteristics (for all, $p>0.05$).



Figure 6. The most commonly viewed YouTube video by a health channel with a total view of 8.900.000 (publicly viewed)

Table 1. Video characteristics according to the groups

Parameter	Physicians (n=50)		Non-physicians (n=50)		p value
	Mean	±SD	Mean	±SD	
Video length (min)	16.6	42.1	7.4	7.9	0.129
Total views	314059.0	677799.5	550820.0	1461419.2	0.301
Days since upload	1382.0	997.5	1661.9	1059.4	0.177
Daily view	502.5	1934.7	282.7	532.2	0.440
Comments	218.5	442.1	280.6	506.0	0.515
Likes	3651.0	12128.0	3785.4	6935.6	0.946
Independent sample test					

The modified DISCERN tool and the quality by GQS evaluated the reliability of the videos. DISCERN and GQS scores according to image type and video content are presented in Table 2.

The mean DISCERN and GQS scores were statistically significantly higher in the physician group compared to the non-physician group (both, $p<0.05$) (Table 3).

The agreement between the two surgeons, according to the DISCERN and GQS scores, is given in Table 4. Accordingly, there was an excellent agreement between the observers.

According to the modified DISCERN scores, 13 (13%) of all videos were of poor reliability, 22 (22%) moderate reliability and 65 (65%) of good reliability. Based on the GQS scale, 15 (15%) of the videos were of poor quality, 22 (22%) videos were of moderate quality and 63 (63%) quality.

Table 2. The modified DISCERN and GQS scores according to the image type and video content

	DISCERN		GQS	
	Mean	±SD	Mean	±SD
Image type				
Animation	4.40	0.83	4.60	0.90
Presentation	3.87	0.76	3.87	0.85
Real image	3.41	0.87	3.34	0.93
Video content				
General info	3.69	0.82	3.70	0.89
Education	4.17	0.77	4.21	0.87
Appendectomy	3.61	0.87	3.46	0.92
Examination	3.21	0.85	3.21	0.91
Imaging	3.00	0.74	3.00	0.92
Treatment	3.29	0.84	3.29	0.90
Patient experience	1.70	0.92	1.50	0.96

Table 3. Comparison of DISCERN and GQS scores between the groups

Parameter	Physicians (n=50)		Non-physicians (n=50)		p value
	Mean	±SD	Mean	±SD	
DISCERN	3.96	0.68	3.20	0.86	<0.001
GQS	3.90	0.74	3.19	0.95	<0.001
Independent sample test					

Table 4. Agreement between the two surgeons

	Mean±SD	p	r	Cronbach α
DISCERN 1	3.52±0.85	p<0.01	0.854	0.863
DISCERN 2	3.58±0.86			
GQS 1	3.55±0.93	p<0.01	0.902	0.796
GQS 2	3.54±1.02			

Discussion

The internet has become a popular source of health information, and video-sharing platforms like YouTube are increasingly being used to access health-related information. However, the quality and reliability of this information still need to be improved. In this study, we analyzed the top 100 YouTube videos about appendicitis and evaluated their reliability and quality using standardized tools.

One of the notable findings was the difference in reliability and quality between videos uploaded by physicians and non-physicians. The mean scores on the DISCERN tool and GQS were significantly higher in videos uploaded directly by physicians. This observation emphasizes the importance of considering the source of information when evaluating the credibility and accuracy of YouTube videos. With their medical expertise and formal training, physicians are more likely to provide reliable and trustworthy information, ensuring a higher quality standard.

Consequently, individuals seeking accurate medical knowledge on appendicitis should prioritize videos uploaded by physicians to minimize the risk of misinformation. Another interesting aspect is the impact of video characteristics on reliability and quality. Animated videos and educational content, as evidenced by higher DISCERN and GQS scores, demonstrated a stronger association with reliability and quality. This finding suggests that engaging visual content and educational focus contribute positively to the overall value of YouTube videos related to appendicitis. Viewers should prioritise animation or educational formats when considering such videos, as they are more likely to provide accurate and reliable information.

The findings of our study revealed several noteworthy aspects regarding the analyzed videos. Firstly, the mean video length of 12.0 ± 30.49 minutes highlights the diverse nature of the content available on YouTube. This variability in video duration may have implications for viewer engagement and attention. Longer videos may require more time commitment and may be perceived as less accessible to those seeking quick, concise information.

Regarding image type, most videos (75%) featured real images, while 10% utilized animation and 15% employed presentation formats. This variation in image type suggests various educational approaches content creators use. Animated videos offer simplified visual explanations, making complex medical concepts more easily understandable for viewers. On the other hand, presentations may rely on slides or visual aids to convey information. Understanding these differences can help viewers select videos that align with their preferred learning style.

It is worth noting that despite the positive overall assessment of reliability and quality, it is crucial to remain cautious when consuming YouTube videos on medical topics. While most videos analyzed in this study exhibited good reliability and quality, the potential for inaccuracies, biases, or outdated information still exists. Therefore, viewers should always verify information from multiple reputable sources and consult with healthcare professionals when making decisions about their health.

In a study by Akpolat et al. evaluating YouTube videos about the surgical treatment of Bankart lesions, the mean video length was 7.07 minutes. 67% were surgical, 27% were animation, and 6% were cadaver videos [18]. In a study by Batar et al. evaluating YouTube videos on nutrition following bariatric surgery, the mean video length was 12.51 ± 7.70 , similar to our result. In the same study, video content was found as patient experience by 76%, informative by 14%, nutrition education by 8.8% and advertisement by 2.6%. DISCERN and GQS scores were significantly higher in the videos uploaded by dietitians than those uploaded by physicians [19]. However, this result is expected because the study evaluated YouTube videos about nutrition following bariatric surgery. In a study by Eroglu et al. about YouTube videos about perianal fistulas, the total video duration was 11.17 hours, and the mean video length was 6.70 ± 8.03 minutes. Similar to our study, in the study by Eroglu

et al., the mean DISCERN score was found as 3.91 ± 0.82 in the videos uploaded by professionals and 3.85 ± 0.80 in those uploaded by non-professionals. In contrast, the mean GQS score was found as 3.97 ± 0.84 in the videos uploaded by professionals and 3.88 ± 0.84 in those uploaded by non-professionals (for both, $p < 0.05$) [20]. These results indicate the need for more health-related YouTube videos to be uploaded by physicians. In another study by Celik et al. on YouTube videos about rotator cuff repair, the mean video length was 7.7 minutes. 21% of videos were animated, and 79% were authentic images. In the same study, the mean DISCERN score was statistically significantly higher in the videos uploaded directly by physicians than in other videos, and 12% of videos were of good reliability [21]. In a study by Toprak et al., DISCERN and GQS scores were higher in the animated YouTube videos. In the same study evaluating YouTube videos on delayed ejaculation, 37.25% of the videos were uploaded by independent users, 27.45% by physicians, 13.73% by non-physician health personnel, 11.76% by sex therapists and 9.80% by health-related websites. In addition, 37.25% of the YouTube videos were of high quality [22].

There are studies in the literature investigating all uploaders separately. In a study by Chen et al. evaluating TikTok and YouTube videos on anal fissures, 38.96% of the videos were uploaded by physicians, 53.25% by non-profit organizations, 5.19% by profit organizations and 2.60% by regular users. In the same study, 20.8% of the videos were of good reliability. The rate of good-reliability and quality videos differs widely depending on the topic of interest [23].

In another study by Levin et al., evaluating YouTube videos on transsphenoidal surgery, 49% of the videos were uploaded by university/academic institutions, 42% by medical advertising/for-profit companies, 4% by independent users and 4% by others [24].

In the literature, there are two studies similar to our study. One was conducted by de'Angelis et al. and assessed the quality of YouTube videos regarding laparoscopic appendectomy by senior surgeons vs novice trainees [25]. However, different measurement tools were used in this study. The second one was performed by Park et al. and evaluated the educational value of YouTube laparoscopic appendectomy videos [26]. However, this study did not use DISCERN and/or GQS scales. In addition, the difference in our study is to evaluate appendicitis and acute appendicitis in a general sense.

Study limitations

This study has several limitations. First, only English videos were subjected to the analysis and videos in other languages were excluded. Second, the search was momentary, and the dynamic nature of YouTube uploads could change the results. Third, our search was limited to the first 100 videos. The assessment of videos with more views might exclude favoured videos uploaded to YouTube more recently. As a strength, this is the first study in the literature to evaluate the reliability and quality of YouTube

videos related to appendicitis and acute appendicitis in a general sense.

Conclusion

In conclusion, our study highlights the importance of evaluating the quality and reliability of YouTube videos related to medical conditions such as appendicitis. Our findings suggest that videos uploaded directly by physicians are more reliable and of higher quality than those uploaded by non-physicians. Using tools such as DISCERN and GQS can aid in evaluating the process and ensure that viewers have access to accurate and trustworthy information.

Despite the positive results, we urge caution when relying solely on YouTube videos for medical information. It is crucial to seek advice from a qualified healthcare provider before making any decisions regarding one's health. Additionally, more efforts should be made to promote creating and disseminating high-quality and reliable medical information on social media platforms.

As the popularity of online health information continues to grow, it is essential to ensure that viewers have access to accurate and reliable information. Our study provides valuable insights into the quality and reliability of YouTube videos related to appendicitis and serves as a starting point for future research in this area. By promoting the creation and dissemination of high-quality health information, we can improve the overall health literacy of society and enhance patient outcomes.

Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical Approval

Ethics committee approval was not needed because the videos were publicly available and did not include human or animal subjects. In the literature, similar YouTube studies had no ethical approval either.

References

1. Moris D, Paulson EK, Pappas TN. Diagnosis and management of acute appendicitis in adults: a review. *JAMA*. 2021;326:2299-311.
2. Snyder MJ, Guthrie M, Cagle S. Acute appendicitis: efficient diagnosis and management. *Am Fam Physician*. 2018;98:25-33.
3. Bhangu A, Søreide K, Di Saverio S, et al. Acute appendicitis: modern understanding of pathogenesis, diagnosis, and management [published correction appears in *Lancet*. 2017;390:1736]. *Lancet*. 2015;386:1278-87.
4. Huerta S. Diagnosis and management of acute appendicitis. *JAMA*. 2022;327:1183-4.
5. Talan DA. Diagnosis and management of acute appendicitis. *JAMA*. 2022;327:1183.
6. Hanna K, Arthur M, Welliver C. Erectile dysfunction and prostate diseases are the predominant Google search terms amongst men's health topics. *Int J Impot Res*. 2022;34:552-7.
7. Tang K, Azhar U, Babar M, et al. Assessing the quality of YouTube videos on adhesive capsulitis. *Cureus*. 2022;14:e27406.
8. Madathil KC, Rivera-Rodriguez AJ, Greenstein JS, Gramopadhye AK. Healthcare information on YouTube: a systematic review. *Health Informatics J*. 2015;21:173-94.
9. List of most visited websites. https://en.wikipedia.org/wiki/List_of_most_popular_websites access date 10.02.2022.
10. Szmuda T, Syed MT, Singh A, et al. YouTube as a source of patient information for Coronavirus Disease (COVID-19): a content-quality and audience engagement analysis. *Rev Med Virol*. 2020;30:e2132.
11. Kūçūkakkas O, İnce B. Can YouTube be used as an educational tool in lymphedema rehabilitation?. *Arch Physiother*. 2022;12:5.
12. Okagbue HI, Ogotunde PE, Bishop SA. Review on the reliability of medical contents on YouTube. *iJOE*. 2020;16:83-98.
13. Leong AY, Sanghera R, Jhaji J, et al. Is YouTube useful as a source of health information for adults with type 2 diabetes? A South Asian perspective. *Can J Diabetes*. 2018;42:395-403.
14. Nason GJ, Kelly P, Kelly ME, et al. YouTube as an educational tool regarding male urethral catheterization. *Scand J Urol*. 2015;49:189-92.
15. Rittberg R, Dissanayake T, Katz SJ. A qualitative analysis of methotrexate self-injection education videos on YouTube. *Clin Rheumatol*. 2016;35:1329-33.
16. Bernard A, Langille M, Hughes S, et al. A systematic review of patient inflammatory bowel disease information resources on the World Wide Web. *Am J Gastroenterol*. 2007;102:2070-7.
17. Esen E, Aslan M, Sonbahar BÇ, Kerimoğlu RS. YouTube English videos as a source of information on breast self-examination. *Breast Cancer Res Treat*. 2019;173:629-35.
18. Akpolat AO, Kurdal DP. Is quality of YouTube content on Bankart lesion and its surgical treatment adequate?. *J Orthop Surg Res*. 2020;15:78.
19. Batar N, Kermen S, Sevdin S, et al. Assessment of the quality and reliability of information on nutrition after bariatric surgery on YouTube. *Obes Surg*. 2020;30:4905-10.
20. Eroglu E, Altinli E. Evaluation of the reliability and quality of YouTube video content about perianal fistulas. *Biomed Res Int*. 2022;2022:2955273.
21. Celik H, Polat O, Ozcan C, et al. Assessment of the quality and reliability of the information on rotator cuff repair on YouTube. *Orthop Traumatol Surg Res*. 2020;106:31-4.
22. Toprak T, Yilmaz M, Ramazanoglu MA, et al. YouTube is inadequate as an information source on delayed ejaculation. *Int J Impot Res*. 2023;35:1-6.
23. Chen Z, Pan S, Zuo S. TikTok and YouTube as sources of information on anal fissure: a comparative analysis. *Front Public Health*. 2022;10:1000338.
24. Levin M, Wu V, Lee DJ, et al. Validity and usefulness of YouTube videos related to endoscopic transsphenoidal surgery for patient information. *J Neurol Surg B Skull Base*. 2021;83:e54-9.
25. de'Angelis N, Gavrilidis P, Martínez-Pérez A, et al. Educational value of surgical videos on YouTube: quality assessment of laparoscopic appendectomy videos by senior surgeons vs. novice trainees. *World J Emerg Surg*. 2019;14:22.
26. Park KB, Kim MJ, Lee JS. Analysis of the educational value of YouTube laparoscopic appendectomy videos. *J Minim Invasive Surg*. 2019;22:119-26.