JOURNAL OF
CONTEMPORARY MEDICINE

DOI:10.16899/jcm.1149853
J Contemp Med 2022;12(5):647-652

Original Article / Orijinal Araştırma

Do The Videos on Social Media About Percutaneous Nephrolithotomy Surgery Provide Quality Information?

Sosyal Medyadaki Perkütan Nefrolitotomi Ameliyatı Videoları Kaliteli Bilgi Sağlıyor mu?

Sedat Yahşi

Ankara City Hospital, Department of Urology, Ankara, Turkey

Abstract

Aim: In this study, it was aimed to evaluate the quality of percutaneous nephrolithotomy (PCNL) surgery videos published on YouTube.

Material and Method: A search was made by entering the keywords 'percutaneous nephrolithotomy' in the youtube search engine. Video quality was measured using the Journal of the American Medical Association Benchmark Score (JAMAS), Global Quality Score (GQS) and modified DISCERN score. Two reviewers developed the PCNL Specific Score (PCNLSS) to estimate the technical quality for every stages of surgery. Video power index (VPI) was used to determine video popularity.

Results: One hundred and thirteen videos had the inclusion criteria were counted in the study. The median VPI, JAMAS, modified DISCERN, GQS and PCNLSS scores were 3.01, 1, 2, 2 and 4, respectively. Videos with audio narration had significantly higher VPI, JAMAS, modified DISCERN, GQS and PCNLSS scores (p=0.001, p<0.001, p<0.001, p<0.001, p<0.001 respectively). Videos with english subtitle had higher JAMAS, modified DISCERN, GQS and PCNLSS scores than videos with no subtitle (p<0.001, p<0.001, p<0.001, p<0.001 respectively). Academical videos had higher VPI, JAMAS, modified DISCERN, GQS and PCNLSS scores than the videos published by urologists (p=0.004, p<0.001, p=0.001, p=0.001, p=0.006 respectively).

Conclusion: In this study, it was seen that the quality of PCNL videos published on social media was insufficient. It should be accepted that social media is frequently used as a source of information today. For this reason, health care professionals should take initiatives through social media to inform patients more accurately.

Keywords: Internet, lithotripsy, nephrolithiasis, quality, webcast

Öz

Amaç: Bu çalışmada YouTube'da yayınlanan perkütan nefrolitotomi (PCNL) cerrahisi videolarının kalitesinin değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntem: Youtube arama motoruna perkütan nefrolitotomi anahtar kelimeleri girilerek arama yapıldı. Video kalitesi, Journal of the American Medical Association Benchmark Score (JAMAS), Global Quality Score (GQS) ve modifiye DISCERN skoru kullanılarak ölçüldü. İki ürolog, ameliyatın her aşaması için teknik kaliteyi değerlendirmek için PCNL Spesifik Skorunu (PCNLSS) geliştirdi. Video popülerliğini belirlemek için video güç indeksi (VPI) kullanıldı.

Bulgular: Dahil edilme kriterlerine karşılayan 113 video çalışmaya dahil edildi. Medyan VPI, JAMAS, modifiye DISCERN, GQS ve PCNLSS skorları sırasıyla 3.01, 1, 2, 2 ve 4 idi. Sesli anlatıma sahip videoların VPI, JAMAS, modifiye DISCERN, GQS ve PCNLSS puanları anlamlı olarak daha yüksekti (sırasıyla p=0,001, p<0,001, p<0,001, p<0,001, p<0,001). İngilizce altyazılı videolar altyazısız videolardan daha yüksek JAMAS, modifiye DISCERN, GQS ve PCNLSS puanlarına sahipti (sırasıyla p<0,001, p<0,001, p<0,001, p<0,001). Akademik videolar, ürologlar tarafından yayınlanan videolardan daha yüksek VPI, JAMAS, modifiye DISCERN, GQS ve PCNLSS puanlarına sahipti (sırasıyla p=0,004, p<0,001, p=0,001, p=0,001, p=0,006).

Sonuç: Bu çalışma sosyal medyada yayınlanan PCNL videolarının kalitesinin yetersiz olduğu göstermiştir. Günümüzde sosyal medyanın bilgi kaynağı olarak sıklıkla kullanıldığı kabul edilmelidir. Bu nedenle sağlık profesyonelleri, hastaları daha doğru bilgilendirmek için sosyal medya üzerinden girişimlerde bulunmalıdır.

Anahtar Kelimeler: İnternet, kalite, nefrolitiazis, taş kırma, web yayını

Corresponding *(İletişim)*: Sedat Yahşi, Department of Urology, Ankara City Hospital, 06800 Ankara, Turkey
E-mail *(E-posta)*: sedatyahsi@yahoo.com
Received *(Geliş Tarihi)*: 27.08.2022 **Accepted *(Kabul Tarihi)*:** 30.08.2022

INTRODUCTION

The incidence of kidney stones has increased significantly in recent years. The incidence is determined by genetic, dietary, ethnic and geographical factors. The risk of recurrence is mainly determined by the disease or disorder that caused the stone formation. Accordingly, the prevalence rates of urinary stones vary between 1% and 20% (1). In the pediatric age group, the annual mean increase in incidence is reported to be approximately 4% (2). It has been shown that the relative increase in the incidence in the adult age group is 1.29 in women and 1.14 in men (3).

Management of kidney stones is determined by the location and size of the stones. For small or uncomplicated stones, follow-up or chemolysis may be a good option. Extracorporeal shock wave lithotripsy (ESWL), retrograde intrarenal surgery (RIRS) or percutaneous nephrolithotomy (PCNL) are the treatment options for kidney stones that are not suitable for follow-up. Treatment guidelines recommend ESWL or RIRS for the treatment of small kidney stones. PCNL is the first line of treatment for >2 cm kidney stones (1). It has continued to be developed and applied since 1976, when it was first defined (4). Although bleeding complications are evident compared to other minimally invasive techniques, the increase in experience with technological developments and changes in technique and instrumentation has reduced the complication rates to acceptable levels. With the stone-free success it has provided for large and complicated kidney stones in the last two decades, open surgery has become almost unusable.

Today, two-thirds of adults search the Internet for health information (5). YouTube (Google, LLC) is the most frequently used social media platform with over 2 billion views per day. It is preferred by almost all internet users (6). Since it is easily accessible, it has also been an important source for medical information. More than one-third of patients follow Youtube videos about their health, and these rates are expected to continue to rise (7). However, some data on YouTube are known to be misleading and incorrect (6). So far, the quality of YouTube videos has been evaluated for many urological and non-urological diseases (8-11). Given that patients with a kidney stone diagnosis are more likely to refer to YouTube for information about PCNL surgery, it is necessary to determine whether these sources provide reliable information. This study is the first research aims to measure the quality of PCNL surgery videos on Youtube using validated questionnaires.

MATERIAL AND METHOD

On March 7, 2022, We made a search by entering the keywords 'percutaneous nephrolithotomy' in the youtube search engine. Four hundred and fifty-one videos were ranked. Videos with at least 100 views and longer than 120 seconds were included in the study. Recorded by urologists, universities or medical companies were included in the assessment. Repetitive videos, irrelevant videos, and low-image quality videos were excluded. One hundred and thirteen videos were selected that met the inclusion criteria.The videos were watched by two urologists (S.Y. and S.T.) who performed PCNL surgery in daily practice. All scoring was done by two surgeons separately. The differences of opinion among the researchers were discussed and a agreed decision was taken.

Videos were classified into groups acoording to region of origin (asia, africa, america, europe), language (no audio, english, other), subtitle language (no subtitles, english, other), source (academic centre, urologist, commercial), content (general information, technical aspects) and target audience (patient, physician). For each video, view numbers, like numbers, dislike numbers, the length of the video (seconds), time since upload on Youtube (days), like ratio (likes/likes+dislikes) and view ratio (view numbers/ time since upload on Youtube) were recorded.

VPI (calculated with like ratio x view ratio / 100) defined in 2018 was used to determine video popularity (12). All videos were evaluated using the previously defined Journal of the American Medical Association Benchmark Score (JAMAS) (13), modified DISCERN score (14) and Global Quality Score (GQS) (15). In the JAMAS questionnaire, the validity of online health information is evaluated by four criteria and gives a score of 1 to 4. Similarly, the Modified DISCERN score assesses the accuracy, reliability and uncertainty of information in videos. As a result of the questionnaire consisting of five questions, one point is given for each criterion. Each point earned increases reliability. GQS provides objective information on how useful a publication is. The PCNL Specific Score (PCNLSS) was defined by two experts for the preoperative, intraoperative and postoperative evaluation of kidney stone disease according to current European Association of Urology guidelines. (1). PCNLSS is a questionnaire consisting of 18 criteria. One point is awarded for each criterion provided (**Table 1**).

Table 1. Percutaneous Nephrolithotomy Specific Score (PCNLSS)a

A. Preoperative evaluation
1. Patient age
2. Gender
3. Body mass index
4. Comorbidities
5. Imaging findings
6. Previous surgery history
B. During surgery
1. Surgery Position: Supine, Prone
2. Number of access to stone
3. Imaging type to access: Flouroscopy or ultrasound
4. Nephroscopen type
5. Perioperative retrograde pyelography findings
6. Irrigation fluid under pressure or hand-pump
7. Fragmentation type: Ultrasonic, pneumatic
8. Tube usage: Re-entry, double-J stent, nothing
C. Follow-up
1. Hospitalization period
2. Duration of tube
3. Complications
4. Postoperative imaging

a: Yes=1 point, No=0 point

The Helsinki Declaration criteria were complied with at all stages of the study.

Statistical Analysis

All statistical analyzes were performed using SPSS 25.0 for Windows (IBM Corp., NY, USA). As descriptive methods, mean, standard deviation, median, minimum, maximum, interquartile range, percentage and frequency were used. Mann-Whitney U-test and Kruskal-Wallis test were used for analysis. Spearman correlation test was used to evaluate the relationship between variables. The significant p value was accepted as <0.05.

RESULTS

Sixty three of the videos (55.8%) were uploaded by urologists, 28 (24.8%) by academic centers and 22 (19.5%) by industry. Seventy-six (67.3%) videos were technically informative, while 37 (32.7%) were general informational videos about PCNL. The videos prepared for physicians were dominant (n=77, 68.1%). 40 of the videos (35%) were uploaded between 2008-2015 and 73 of them (65%) were uploaded between 2016-2022. The median time since upload was 308 days and the median view number was 3839. The median view ratio was 3.01 (interquartile range, 0.62-13.86). The median number of like was 14 (interquartile range, 2.5-61.5). Dislikes were closed to comments on all uploaded videos. Therefore, the like ratio of all videos was 100%. Since the VPI calculation is obtained by multiplying the like ratio and the view ratio, the view ratio of all videos can be considered as VPI. The median (interquatile range) VPI, JAMAS, Mod DISCERN Score, GQS and PCNLSS were 3.01 (0.62-13.86), 1 (1-2), 2 (1-2), 2 (1-3) and 4 (2-6.5), respectively. Statistical results are summarized in **Table 2.**

There was no difference between the regions of origin of the videos in terms of JAMAS, Modified DISCERN, GQS, PCNLSS and VPI (p=0.173, p=0.321, p=0.304, p=0.364, p=0.051, respectively). While the number of views of the videos originating from America is significantly higher than the videos originating from Asia and Africa, it is similar to the videos originating from Europe (p=0.009, p=0.026, p=0.201, respectively). Videos with English narration received higher ratings in terms of number of views, VPI, JAMAS, Modified DISCERN, GQS and PCNLSS compared to videos with no audio (p=0.007, p<0.001, p<0.001, p<0.001, p<0.001, p<0.001, respectively). Videos with English subtitles also had significantly higher scores for JAMAS, Modified DISCERN, GQS, and PCNLSS compared to videos with no subtitles (p<0.001, p<0.001, p<0.001, p<0.001, respectively). While the GQS of the videos with general information were higher than technically informative videos (p=0.028), there was no difference in terms of other scores (**Table 3**).

Positive correlations were observed between the scores (JAMAS, Mod DISCERN, GQS and PCNLSS) and the number of views (r=0.276, p=0.003; r=0.307, p=0.001; r=0.350, p<0.001; r=0.282, p=0.002, respectively), the number of likes (r=0.232, p=0.007; r=0.322, p<0.001; r=0.287, p=0.001; r=0.254, p=0.003, respectively) and VPI (r=0.326, p<0.001; r=0.375, p<0.001; r=0.420, p<0.001; r=0.328, p<0.001, respectively). VPI was not correlated with both video duration and time since upload (p=0.445, p=0.185, respectively).

Table 2. Basic features of videos

Parameter	Value
Region of orgin	
Europe	24 (21.2)
Asia	57 (50.4)
America	24 (21.2)
Africa	8 (7.1)
Video Language	
No audio	54 (47.8)
English	51 (45.1)
Other	8 (7.1)
Subtitle	
No subtitle	35 (31.0)
English	68 (60.2)
Other	10 (8.8)
Video source	
Urologist	63 (55.8)
Academic center	28 (24.8)
Commercial	22 (19.5)
Video content	
General information	37 (32.7)
Technical aspect	76 (67.3)
Target audience	
Physicians	77 (68.1)
Patients	36 (31.9)
Number of views	3839 (534.5-21985.5)
Number of likes	14 (2.5-61.5)
Video duration (s)	308 (170.5-497)
Time since upload (d)	1410 (702.5-2738.5)
View ratio	3.01 (0.62-13.86)
Like ratio	100 (100-100)
JAMAS	1 (1-2)
Modified DISCERN	2 (1-2)
GQS	2 (1-3)
PCNLSS	4 (2-6.5)
VPI	3.01 (0.62-13.86)

Values are presented as number (%) or median (interquartile range). JAMAS, Journal of the American Medical Association Score; PCNLSS, Percutaneous Nephrolithotomy Specific Score; GQS, Global Quality Score; VPI, video power index.

Table 3. The scores according to the group characteristics.

Parameter	JAMAS	p value	M. DISCERN	p value	GQS	p value	PCNLSS	p value	VPI	p value
Region of orgin		0.173		0.321		0.304		0.364		0.051
Europe	1 (1-2)		2 (1-2.5)		2 (1-3)		5 (3-7)		3.17 (1.5-8.7)	
Asia	1 (1-1)		2 (1-2)		2 (1-2)		4 (2-6)		2.06 (0.58-12.2)	
America	1 (1-2)		2 (1-3)		2 (1.5-3)		4 (2-7.5)		10.06 (1.39-72.1)	
Africa	1 (1-1.5)		2 (1-2)		2 (2-2.5)		4.5 (3-7.5)		0.52 (0.35-4.8)	
Language		<0.001*		<0.001*		<0.001*		<0.001*		<0.001*
No audio	1 (0-1)		1 (1-2)		2 (1-2)		3 (2-6)		1.995 (0.29-6.83)	
English	1 (1-2)		2 (2-3)		2 (2-3)		6 (3-8)		8.58 (1.25-23.1)	
Other	1 (1-1)		2 (1-2)		2 (2-2)		3.5 (2-4)		1.68 (0.38-5.4)	
Subtitle		<0.001*		<0.001*		<0.001*		<0.001*		0.214
No subtitle	1 (0-1)		1 (0-2)		1 (1-2)		2 (2-4)		2.06 (0.47-6.84)	
English	1 (1-2)		2 (2-3)		2 (2-3)		5.5 (3-7.5)		5.04 (0.77-14.8)	
Other	1 (1-1)		1 (1-2)		2 (2-2)		4 (4-5)		2.62 (0.43-22.4)	
Source		<0.001*		0.001*		0.002*		0.015*		0.002*
Urologist	1 (1-1)		2 (1-2)		2 (1-2)		4 (2-6)		1.72 (0.43-6.83)	
Academic	2 (1-2)		2 (2-3)		2 (2-3)		6 (3.5-7.5)		6.52 (1.73-29.7)	
Commercial	1 (1-2)		2 (1-2)		2 (2-3)		4 (3-5)		9.94 (1.24-23.1)	
Video content		0.185		0.109		0.028*		0.222		0.07
General information	1 (1-2)		2 (1-2)		2 (2-3)		4 (2-5)		7.47 (0.75-24.3)	
Technical aspect	1 (1-2)		2 (1-2)		2 (1-2)		4.5 (2-7)		2.2 (0.58-8.21)	

Values are presented as median (interquartile range). JAMAS, Journal of the American Medical Association Benchmark Score; M. DISCERN, Modified DISCERN; GQS, Global Quality Score; PCNLSS, Percutaneous Nephrolithotomy Specific Score; VPI, video power index. *p<0.05

DISCUSSION

In the last two years, with the effect of the coronavirus pandemic, people have started to do more research about their health through social media platforms. YouTube, which is the platform with the most video sharing, is one of them (6). It has also been found that YouTube is more effective at providing information and changing behavior and habits than blog sites such as Twitter and Facebook (16). Disease and surgery videos shared on Youtube can appeal to both patients and physicians. In the last decade, the reliability of the information in youtube videos has been the subject of research on many different topics such as cataract surgery, breast cancer, bladder cancer, abdominal aortic aneurysm, heart attack, and so on (10,17-20). There has been no study in the literature investigating the reliability of PCNL videos on Youtube so far. Our study is the first evaluation in the literature with this aspect.

In our study, the JAMAS, Modified DISCERN, GQS and PCNLSS scores of the videos with English narration and subtitles were significantly higher than the videos without audio and subtitles. In addition, the VPI value of the videos with English audio was higher than the videos without audio. These findings reveal that videos with English narration and subtitles provide more accurate information for patients and physicians, and are more educational for physicians to perform this procedure. The educational effect of using visual stimulus and auditory stimulus together can be seen. Similar to our study, the positive contribution of English voice narration on the GQS score was also stated in a previous study (11). For this reason, English audio narration and English subtitles, which is the most frequently used language in education and business life, are necessary for the videos prepared for this purpose to be of higher quality.

Most of the videos we evaluated were uploaded by healthcare professionals. Futhermore, most of the videos contained technical details and appealed to clinicians. The JAMAS, Modified DISCERN, GQS, PCNLSS and VPI scores of urologist-sourced videos were found to be significantly lower than academic and commercial videos. While most of the videos prepared by urologists only emphasize some key points of the operation, the diagnosis and treatment stages are explained more systematically in academic centers and commercial videos which are supported by animation images. When we look at the first seven videos with over 150K views, the fact that five of them are animation videos is proof of how effective this technique is. In the urologist-sourced videos in which the details of the surgery were explained, PCNLSS scores were expected to be high, but low on the contrary. This result shows that most of the videos are individually prepared, decided at the moment, unprepared and sloppy. The fact that the VPI median value is 3-4 times lower supports this idea. The poor quality of these videos, which will be preferred more by physicians, will be an insufficient or misleading source of information, especially for those who watch for educational purposes. Moreover, these poor quality videos shared in order to gain more recognition or increase the number of followers may cause negative effects contrary to their purpose.

GQS is a scoring system that provides objective information about how useful a post is (15). It can be accepted that patients will benefit more from general information rather than technical information about an operation. Considering that the patient audience will be many times larger than the physician audience, it is understandable that the GQS score, which evaluates how useful a video is, is higher in videos containing general information. As mentioned above, the poor quality of videos containing technical information also contributes to this.

Median JAMAS, Modified DISCERN, GQS, PCNLSS, and VPI scores were found to be 1,2,2,4, and 3.01, respectively, when looking at all the videos included in the study. These low results indicate that PCNL videos posted on youtube provide insufficient information. Similarly, low results were obtained in many previous studies (11,21). Moreover, it is known that 75% of patients do not consider the reliability of the information source when using the internet to get medical information. The most watched video may not be the most reliable due to search engine algorithms. In addition, advertising videos often lead the user by being featured in the most watched or more popular videos section on YouTube. (16). It is obvious that healthcare professionals and patients who use Youtube as a source of information can obtain incorrect or insufficient information. For this reason, it is necessary for health institutions to accept that social media platforms are frequently used as a source of information, and to prepare and upload videos with evidence-based data for accurate and sufficient information presentation.

A significant positive correlation was found between the number of views, the number of likes, VPI values and the scores of JAMAS, Modified DISCERN, GQS, PCNLSS. This correlation shows that the view numbers, the like numbers and the VPI value are related to the video quality. With these findings, it is revealed that video producers should consider the criteria of these scoring systems in the preparation stage in order to get more views.

The number of videos in our study was relatively higher than similar studies in the literature. In a study, when the results of search engines and the habits of searchers were taken into account, it was seen that 97% of researchers only clicked on the top 10 results. In addition, it has been seen that search engines offer the desired results on the first page with 82.5% probability (22). With this information, it can be said that the 113 videos we have included in our study are numerically sufficient. Another limitation is the evaluation of the videos by two urologists. However, the fact that they perform >20 PCNL surgeries per year and have more than ten years of experience overrides the limitation. Despite all this, it can be considered that we have contributed siginificantly to the litarature by evaluating PCNL videos published on Youtube with valid scoring systems and criticizing them to be more accurate and reliable.

CONCLUSION

This research has shown that PCNL videos shared on Youtube do not provide reliable information for physicians and patients. In most of the videos, the topics were not covered in integrity and did not comply with the evidence-based information principles. It was determined that videos with English narration and subtitles were more effective. Videos supported with animation images, arranged systematically with diagnosis-treatment stages, provided the highest scores. Today, access to information from social media is quite common thanks to mobile devices; therefore, healthcare professionals should produce and share education models that will present accurate and reliable knowledge about PCNL.

ETHICAL DECLARATIONS

Ethics Committee Approval: No ethics approval was received for this study since it doesn't include human or animal subjects.

Informed consent: There is no need for infromed consent since the present study doesn't include human or animal subjects.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The author has no conflicts of interest to declare.

Financial Disclosure: The author declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

Acknowledgments: The author would like to thank Şenol Tonyalı for his help on developing PCNL spesific score and evaluating the videos.

REFERENCES

1. Urolithiasis Guidelines, European Association of Urology, 2021 [Cited 5 May 2022] Available from https://uroweb.org/guidelines/urolithiasis, 2021.
2. Kittanamongkolchai W, Vaughan LE, Enders FT, et al. The changing incidence and presentation of urinary stones over 3 decades. Mayo Clin Proc 2018;93:291-9.
3. Dwyer ME, Krambeck AE, Bergstralh EJ, Milliner DS, Lieske JC, Rule AD. Temporal trends in incidence of kidney stones among children: a 25-year population based study. J Urol 2012;188:247-52.
4. Fernström I, Johansson B. Percutaneous pyelolithotomy. A new extraction technique. Scand J Urol Nephrol 1976;10:257-259.
5. World Internet Users Statistics and 2019 World Population Stats. [Cited 5 May 2022] Available from www.internetworldstats.com/stats.htm.
6. Madathil KC, Rivera-Rodriguez AJ, Greenstein JS, Gramopadhye AK. Healthcare information on YouTube: A systematic review. Health Informatics J 2015;21:173-194.
7. Langford A, Loeb S. Perceived Patient-Provider Communication Quality and Sociodemographic Factors Associated With Watching Health-Related Videos on YouTube: A Cross-Sectional Analysis. J Med Internet Res 2019;21:e13512.
8. Andika R, Kao CT, Williams C, Lee YJ, Al-Battah H, Alweis R. YouTube as a source of information on the COVID-19 pandemic. J Community Hosp Intern Med Perspect 2021;11:39-41.
9. Baran C, Yilmaz Baran S. Youtube videos as an information source about urinary incontinence. J Gynecol Obstet Hum Reprod 2021;50:102197.
10. Brachtenbach T, Cardenas R, Pate H, et al. YouTube: Searching for answers about breast cancer. Breast Dis 2020;39:85-90.
11. Tonyali S. YouTube: A good source for retrograde intrarenal surgery? Investig Clin Urol 2021;62:180-5.
12. Erdem MN, Karaca S. Evaluating the Accuracy and Quality of the Information in Kyphosis Videos Shared on YouTube. Spine (Phila Pa 1976) 2018;43:1334-9.
13. Silberg WM, Lundberg GD, Musacchio RA. Assessing, controlling, and assuring the quality of medical information on the Internet: Caveant lector et viewor-Let the reader and viewer beware. JAMA 1997;277:1244-5.
14. Handler SJ, Eckhardt SE, Takashima Y, Jackson AM, Truong C, Yazdany T. Readability and quality of Wikipedia articles on pelvic floor disorders. Int Urogynecol J 2021;32:3249-58.

15. Bernard A, Langille M, Hughes S, Rose C, Leddin D, Veldhuyzen van Zanten S. A systematic review of patient inflammatory bowel disease information resources on the World Wide Web. Am J Gastroenterol 2007;102:2070-7.
16. Selvi I, Baydilli N, Akinsal EC. Can YouTube English Videos Be Recommended as an Accurate Source for Learning About Testicular Self-examination?. Urology 2020;145:181-9.
17. Bae SS, Baxter S. YouTube videos in the English language as a patient education resource for cataract surgery. Int Ophthalmol 2018;38:1941-5.
18. Loeb S, Reines K, Abu-Salha Y, et al. Quality of Bladder Cancer Information on YouTube. Eur Urol 2021;79:56-9.
19. Radonjic A, Fat Hing NN, Harlock J, Naji F. YouTube as a source of patient information for abdominal aortic aneurysms. J Vasc Surg 2020;71:637-44.
20. Fialho I, Beringuilho M, Madeira D, et al. Acute myocardial infarction on YouTube - is it all fake news?. Rev Port Cardiol (Engl Ed) 2021;40:815-25.
21. Betschart P, Pratsinis M, Müllhaupt G, et al. Information on surgical treatment of benign prostatic hyperplasia on YouTube is highly biased and misleading. BJU Int 2020;125:595-601.
22. Morahan-Martin JM. How internet users find, evaluate, and use online health information: a cross-cultural review. Cyberpsychol Behav 2004;7:497-510.