YouTube provides insufficient information on patellofemoral instability

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Abstract

Objective: Videos uploaded to YouTube do not go through a review process, and therefore, videos related to patellofemoral instability may have little educational value. The purpose of this study was to assess the educational quality of YouTube videos regarding patellofemoral instability.

Methods: A standard search was performed on the YouTube database using the following terms: “unstable kneecap,” “patellar instability,” “patellofemoral instability,” “kneecap dislocation,” and “patellar dislocation,” and the top 50 videos based on the “relevance” assignment of the YouTube algorithm were included for analysis. The properties, content, and source of each video were recorded. The educational quality of videos was analyzed according to scores obtained using DISCERN, the criteria of Journal of the American Medical Association, Global Quality Score, and Patellofemoral Instability Specific Score, and the quality of the videos was evaluated according to the groupings of these scoring systems.

Results: A total of 250 videos were identified, of which 89 were included in the study for analysis. The mean video duration was 11.72 ± 22.03 minutes. The median number of views was 4516.5 (range, 3-6,044,971). The content of the videos was disease-specific in 60%, 20% were related to surgical technique or approach, and 14.1% were exercise videos. Most of the videos were uploaded by physicians (33.7%). The Global Quality Score and DISCERN scores were significantly correlated with video duration. The Patellofemoral Instability Specific Score was significantly correlated with video duration, number of views, view rate, likes, and Video Power Index. According to the DISCERN classification, 69.9% of the videos were very insufficient or insufficient. The Global Quality Score and Patellofemoral Instability Specific Score, 65.2% of videos were evaluated as very low or low. According to the Global Quality Score, 60.7% of videos were rated as poor quality.

Conclusion: The quality of YouTube videos about Patellofemoral instability is insufficient. It was found that viewers tend to watch short and low-quality videos.

Introduction

The internet has become a common source of information around the world, and 80% of internet users refer to web resources for health information.1 Video-based information exchange is expected to increase in the next few years.2 The second most used social media network today is YouTube, a global social network used in 88 countries and translated into 76 different languages with more than 1 billion users.3,4 YouTube has become an incredibly fast-growing video database, with more than 300 video uploads per minute and more than 100 million hours of video views per day.5

Patients use the internet not only to find answers to their questions about medical issues but also to search for treatment options for diseases.3 Therefore, the popularity of YouTube among patients is gradually increasing.6 The internet has also become a popular source of patient health information in orthopedics, with up to 30% of patients reported to use this online platform to obtain disease-related information.3 The use of the internet to provide orthopedic disease-specific information is likely to remain prevalent. However, videos uploaded to YouTube do not go through a review process, and many do not include information about the authors or the source. This has led to the sharing of low-quality and possibly inaccurate/non-reliable content among patients2,5 as users are generally not familiar with the accuracy or reliability of the source and may also be exposed to misleading advertisements. Therefore, it is imperative that physicians know and critically assess such sources to help educate patients and guide them in the management of their disease so that they are not misinformed.3

Patellofemoral instability (PFI), which is one of the most prevalent knee problems in orthopedics,5,7 is a general term that includes patellar dislocation, patellar subluxation, and symptomatic patellar instability.8 This may be caused by a basic morphological variability in patellofemoral articulation and alignment or by a traumatic injury.4 The incidence of continuing mechanical symptoms in the patellofemoral joint is quite high for such patients. Approximately 50% of patients cannot return to their previous level of sports activity, and over 70% suffer from some form of limitation.6,8
The educational aspect of YouTube videos on many diseases and treatments, including orthopedic problems, has been assessed in many studies. Although it is commonly experienced, there has been no research on the educational aspect of YouTube videos related to PFI. The hypothesis of this study was that the educational aspect of these videos related to PFI may be insufficient. Therefore, the purpose of this study was to assess the educational quality of YouTube videos about PFI.

Materials and Methods

Using Google Chrome (version 92.0.4515.159-64 bit) with cache cleared, cookies deleted, and a personal YouTube account that was not used, a standard search was performed on the YouTube database using the following terms: "unstable kneecap," "patellar instability," "patellofemoral instability," "kneecap dislocation," and "patellar dislocation" on May 8, 2021. For each search term, the top 50 videos based on the "relevance" assignment of the YouTube algorithm were included in the analysis. This yielded a total of 250 videos. The inclusion criteria for the videos were English language, primary content on PFI, and acceptable audio–visual quality. Repeated videos, audio-only or visual-only videos, non-English videos, and videos not about PFI, news, drama, or satire videos were excluded from the examination. Videos of more than 1 episode were considered as 1 item and there was no limit to the length of the videos. A YouTube account was created for the study, and all video links received were listed after the duplicates were removed. The videos excluded were 67 duplication videos, 12 non-English videos, 3 videos with visual only, 17 videos about knee diseases or knee arthroscopy other than PFI, 1 video about patella dislocation for dogs, 16 videos on news about patella injuries of athletes, and 15 videos showing patella dislocation at the time of the accident or in the emergency room. Twelve videos consisting of 7 episodes and 5 episodes were combined and assessed as 2 videos. After the exclusions, the remaining 89 videos were included in the study.

The following video features were listed for each included YouTube video: (1) title, (2) video duration, (3) views, (4) video source/upload, (5) content type, (6) number of days since upload, (7) view rate (views/day), (8) likes, (9) dislikes, (10) likes rate (like × 100/ [like + dislike]) and (11) Video Power Index (VPI). Video sources and uploaders were categorized as: (1) academic (related to authors or uploaders affiliated with research groups, universities, or colleges); (2) physician (independent physician or group of physicians with no research, university, or college affiliation); (3) non-physicians (healthcare personnel other than licensed doctors); (4) exercise trainer; (5) medical source (content or animations from health websites); (6) patient; and (7) commercial. The content was categorized as: (1) exercise education, (2) disease-specific knowledge, (3) patient experience, (4) surgical technique or approach, (5) non-surgical management, and (6) advertising. Video Power Index is a calculation derived from the following formula: (like rate × view rate/100). This metric is a video popularity index because YouTube does not have an index that defines the popularity of videos by the number of views and likes.

The Journal of the American Medical Association (JAMA) criteria were used to assess video accuracy and reliability. This system consists of 4 separate criteria, each of which is assigned a score of 1, and provides a non-specific assessment of source reliability. A score of 4 indicates higher source accuracy and reliability, while a score of 0 indicates poor source accuracy and reliability. Although not validated, these criteria have previously been widely used in the literature to assess the reliability of online resources.

Three different scoring systems were used to assess the educational value of PFI videos. The Global Quality Score (GQS) provides a non-specific assessment of educational value through 5 criteria, with a maximum score of 5 indicating high quality of education. For PFI-related information, an assessment criterion of Patellofemoral Instability Specific Score (PFISS) was established to better assess the educational content. Patellofemoral Instability Specific Score consists of 20 items based on the guidelines published by the American Academy of Orthopedic Surgeons, a method that has been proven to be applicable in the literature.

The DISCERN score was developed in Oxford, United Kingdom, to assess written health information. The original DISCERN consists of 16 questions scored from 1 to 5 and total scores ranging from 6 to 80; higher scores indicate better quality.

The author who included videos for assessment and raters were separate researchers and blind to others’ work. The video links were presented to the observers in the form of a table, and the 2 observers evaluated and scored the videos according to the DISCERN, GQS, JAMA, and PFISS scoring systems. In DISCERN, the videos were evaluated as “very poor” (16-18), “poor” (29-41), “fair” (42-54), “good” (55-67), and “excellent” (68-80). In JAMA, a score of 1 point indicates the lowest quality information, and a score of 4 indicates the highest quality information. The GQS has a maximum score of 5, indicating high educational quality. With full points in these scoring systems, the education, reliability, and content quality of videos were evaluated as high quality and sufficient.

Ethical approval was not required as this article does not contain any studies with human participants or animals performed by any of the authors.

Statistical Analysis

Data were analyzed with International Business Machines Statistical Package for the Social Sciences Statistics, version 20 software (IBM SPSS Corp., Armonk, NY, USA). Categorical data were reported as frequency (n) and percentage (%), while continuous data were reported as mean values. Where applicable, normal distribution was investigated using the Shapiro–Wilk test. The Spearman correlation test was used to analyze the relationships between quantitative variables. The Spearman correlation coefficients were evaluated as follows: 0.00-0.19 as “very weak,” 0.20-0.39 as “weak,” 0.40-0.59 as “moderate,” 0.60-0.79 as “strong,” and 0.80-1.00 as “very strong.”
“moderate,” 0.60-0.79 as “strong,” and 0.80-1.0 as “very strong.” For video quality assessment, agreement between the 2 reviewers was analyzed using the interclass correlation coefficient (ICC) followed by the 95% CI reported within parentheses. Interclass correlation coefficient values <0.5 were categorized as poor reliability, values between 0.5 and 0.75 as moderate reliability, values between 0.75 and 0.9 as good reliability, and values > 0.90 as excellent reliability.

Results

The mean video duration was calculated as 11.72 ± 22.03 minutes (range, 0.13-139.52 minutes). The number of views was median 4516.5 (range, 3-6 044 971). The number of days since upload was median 780 (range, 25-11 335). The median view rate was 5.88 (range, 0.02-1782.65). The median number of likes was 46.5 (range, 0-333 000) and the median number of dislikes was 2 (range, 0-3100). The like ratio value was median 97.08 (range, 0-100) and the median VPI value was 5.7 (range, 0-1693.52).

The content of the videos was disease-specific information in 42 (47.2%), related to the surgical technique or approach in 18 (20.2%), a non-surgical method in 9 (10.1%), exercise education in 12 (13.5%), advertising in 5 (5.6%), and patient experience in 3 (3.4%). Of the surgical videos, 9 were presentations made by orthopedic surgeons at scientific meetings, and 4 were surgical operation videos. The video sources were determined as doctors in 28 (31.5%), academicians in 18 (20.2%), non-physician healthcare personnel in 18 (20.2%), exercise trainers in 12 (13.5%), a medical source in 7 (7.9%), commercial in 5 (5.6%), and a patient in 1 (1.1%).

Interobserver agreement was fair for JAMA, good for PFISS, and excellent for GQS and DISCERN. The mean points given by the observers according to these scoring systems and the ICC values of interobserver agreement are shown in Table 2. According to the DISCERN classification, 34.4% of the videos were very insufficient, 35.5% were insufficient, 17.2% were average, and 12.9% were good. According to the PFISS, 41 (46.1%) videos were evaluated as very low, 17 (19.1%) as low, 15 (16.8%) as moderate, 15 (16.8%) as high, and 1 (1.2%) as very high. According to the GQS, 60.7% of the videos had a score of 2 or less, which was considered poor quality. There was a significant correlation between DISCERN and JAMA, DISCERN and GQS, PFISS and GQS, and PFISS and DISCERN scores (Table 3).

Global Quality Score and DISCERN scores were significantly correlated with video duration. The PFISS score was significantly correlated with video duration, number of views, view rate, likes, and VPI (Table 4).

Discussion

The main finding of this study was that the quality and information content of the videos on PFI was poor based on all scoring systems. Considering previous studies assessing YouTube videos, it is not surprising to observe that this also applies to PFI. Taking into account this situation and considering that YouTube is an information source frequently used by patients, orthopedists should aim to create and provide more accurate, reliable, and useful information sources to patients.

Increasingly, patients search for a possible diagnosis online before going to orthopedic clinics or go to the clinic having searched for online information after the first consultation. The vast majority

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**Table 1. PFI-specific score or PFISS**

| Score | Criteria | Example |
|-------|----------|---------|
| 4     | Patient presentation | 0.5 point: Knee buckles and can no longer support your weight |
| 3     | Diagnosis and evaluation | 1 point: Describes patellofemoral joint anatomy |
| 2     | Treatment | 1 point: Mentions patellar dislocation or subluxation and that there may be a need for reduction |
| 1     | Information about unstable kneecap | 1 point: Describes mechanism of instability |

Reference: Fictional data, for illustrative purposes only.

PFISS, Patellofemoral Instability Specific Score; PFI, patellofemoral instability.

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**Table 2. Interobserver agreement assessments based on the scoring systems**

| Criteria | Observer | Average | SD | Median | Min. | Max. | ICC (95% CI) |
|----------|----------|---------|----|--------|-----|-----|-------------|
| JAMA     | 1        | 1.44    | 0.85 | 1.00   | 0.00| 4.00| 0.566 (0.353-0.708) |
|          | 2        | 2.30    | 0.87 | 2.00   | 1.00| 4.00|             |
| GQS      | 1        | 2.40    | 1.01 | 2.00   | 1.00| 5.00| 0.922 (0.884-0.948) |
|          | 2        | 2.57    | 1.03 | 2.00   | 1.00| 5.00|             |
| DISCERN  | 1        | 33.67   | 11.28| 30.00  | 18.00| 60.00| 0.980 (0.970-0.986) |
|          | 2        | 34.08   | 11.69| 31.00  | 17.00| 65.00|             |
| PFISS    | 1        | 5.56    | 4.62 | 4.00   | 0.00| 19.00| 0.862 (0.795-0.907) |
|          | 2        | 6.81    | 5.86 | 5.00   | 0.00| 19.00|             |

JAMA, Journal of the American Medical Association; GQS, Global Quality Score; PFISS, Patellofemoral Instability Specific Score; SD, standard deviation.
of physicians experience a situation in which a patient comes to the consultation having already obtained information from the internet. This has a profound effect on the patient–physician relationship, and 38% of physicians believe that the patient who comes with pre-information makes the consultation less efficient. As resources such as YouTube are searched by patients and can play a role in their decision-making processes, physicians should be aware of the quality of the content on such platforms. Therefore, the educational aspect and reliability of YouTube videos related to many branches and diseases in medicine and dentistry have been examined in this regard. There are also studies on YouTube videos related to orthopedic diseases. However, the number of studies on the educational aspect of YouTube videos in orthopedics is still insufficient compared to other medical branches. One of these diseases that has not been examined in the literature is PF. The results of this study show that YouTube videos provide insufficient information about PF.

In the current study, the interobserver agreement for DISCERN, PFISS, and GQS was excellent-good, and for JAMA scoring, it was moderate. Cassidy et al. stated that using a more interpretable scoring system in the JAMA scoring system may reduce interobserver agreement. As a result of this open-to-interpretation scoring, the interobserver agreement of the JAMA scoring in this study may be lower compared to other scoring systems. The PFISS system was designed for this study based on previous studies in the literature. The excellent inter-observer agreement for PFISS and the positive correlation with the DISCERN scoring system can be interpreted as sufficient scoring in terms of interobserver agreement, since it is less affected by personal interpretation at the point of assessing the information. Another advantage was that patients were able to find answers to their questions about PF.

Čelik et al. reported a positive correlation between video quality and video duration, which was similar to the current study findings. In contrast, Ferhatoğlu et al. reported that there was a negative relationship between video quality scores and the popularity of videos. In another study, it was reported that the number of views for long videos is low and people are more interested in short videos. As the duration of the videos increases, the videos may become too boring or sophisticated for the patients. However, it seems that the duration of the videos needs to be increased in order to convey a certain level of information to the patients. This negative relationship complicates the situation, which can only be interpreted as an indication that there is a need for simple videos prepared by healthcare professionals to be as short as possible but convey sufficient information to the patient.

More than 50% of the video uploaders in this study were doctors or academic staff, and 65.2% of the videos were about the disease. However, the quality of the videos was still insufficient. The reason for this may be that some orthopedists talk about the disease and surgical aspects, whereas physical therapy and sports physicians focus more on the rehabilitation part of the disease. Although this approach can be considered the right way for physicians as the target audience, for someone who is not familiar with the disease, this can easily cause confusion. As a result, for example, a patient in need of rehabilitation may seek surgical treatment, or vice versa. The only way to overcome this situation is for associations or institutions to create videos that address the disease in all its aspects. At the same time, patients can be directed to these videos during the consultation to ensure that they receive accurate information.

In previous studies, very few videos presenting patient experience and surgical treatment have been published compared to other types of content (10, 14, 21, 23). In the current study, surgical videos exceeded non-surgical treatment and exercise videos. In addition, the vast majority of these videos were from meetings attended by orthopedic surgeons or were operation videos. This could show a tendency for orthopedic surgeons to share scientific meeting videos and more surgical videos related to PF. Although surgical videos contain valuable visual information for professionals and for medical training, it can be difficult for a patient to understand technical information. Moreover, videos of operations may be too sensational for a person who has not had medical training. Therefore, these videos may not be of interest to patients. It is also possible that surgical technique videos or those uploaded for surgeon training may have low quality and reliability points according to patients as they are not the target mass. The high number of surgical videos in this study may have been a reason for the insufficiency on the subject of patient education.

This study has some limitations. The scoring systems involve a degree of subjectivity, as what one scoring surgeon considers to be a sufficient presentation or explanation for a particular issue may have been perceived differently by another observer. There are no validated tools available to assess the quality of health information in videos. Therefore, quality assessment checklists were created for this study based on a review of the relevant literature on PF and expert discussions. Although PFISS was found to correlate with DISCERN and had excellent inter-observer agreement, the reliability of PFISS needs to be validated by new studies. The database search was performed using 5 search terms at a single time point. Changes in the keywords affect the search results, causing different videos to be listed. Therefore, different results can be obtained with different listing schemes.
The addressed video list depends on YouTube's interpretation of the keywords. YouTube is a dynamic repository of video information, which means that search results may change over time. The results of the YouTube search algorithm may also vary depending on variables such as geographic location or user characteristics. The analysis in this study was limited to content that was searched directly on the YouTube site and may not take into account videos accessed from links on other sites that patients may use to access information about a PFI diagnosis. Similarly, considering the YouTube video pool and the search results, the top 50 videos that appear in the search may be a very small part of this repository. Finally, non-English videos were excluded from the analysis, further reducing the generalizability of the results.

As JAMA questioned the reliability of the video source, the other scoring systems and evaluations of this study addressed PFI as a whole. This means that only the educational aspect of a video dealing with a specific subject related to PFI such as treatment options or postoperative procedures may emerge as lacking in these evaluations, but there may be sufficient information presented and fluency provided in the subject focused on. The positive correlation of video duration with the scoring systems with the exception of JAMA could be related to this.

A video addressing a specific condition related to PFI will be short, and as not all subjects are examined, the points will be low. If the aim of this study had been to confirm the accuracy of information about PFI presented in YouTube videos or to reveal incorrect information, then this would have constituted a major deficiency of the study. However, the aim of the study was to examine the adequacy of the levels of information in the videos for patient education. When this is taken into consideration, a patient informed about PFI surgery may be directed to surgical treatment options without being aware of complications, or, in contrast, a patient only informed about exercise and surgical complications in PFI treatment may not accept surgical treatment. Therefore, videos for patient education must address the disease as a whole. When this is considered and the expectation that in the near future videos will be the main information resource [24], some conclusions can be drawn; (1) patient education videos should be prepared by institutions and associations dealing with the disease; (2) in consultations, physicians should encourage patients seeking information about the disease to watch these videos; (3) the videos should address the disease as a whole; (4) these videos should not be very long, should not use medical terms that will lose the interest of the patient, and should include images/animations; (5) the advantages and disadvantages of the treatments and disease should be dealt with clearly; and (6) new treatment protocols and approaches should be updated at certain intervals.

In conclusion, the results of this study demonstrated that the quality of YouTube videos about PFI is insufficient, and viewers tend to watch short and low-quality videos. Therefore, it may be an option to provide high-quality information through official websites that provide education to patients on PFI and to recommend these sites to patients.

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