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ORIGINAL ARTICLE

Is YouTube a Reliable Source of Information in Chondrosarcomas?

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Abstract

Background: YouTube, a widely popular video platform, is inviting due to its easy access, and the quality and reliability of the information are not questioned or monitored, allowing non-medical individuals to share medical information. Our aim is to examine the reliability, validity, and comprehensiveness of English videos available on YouTube regarding chondrosarcoma.

Methods: In June 2024, a search for the term "chondrosarcoma" on YouTube was performed, and the top 50 most viewed videos ranked by relevance were evaluated. Videos were evaluated using the Journal of the American Medical Association (JAMA) criteria and modified DISCERN criteria for YouTube. The coverage score regarding the diagnosis and treatment of chondrosarcoma in these videos was also evaluated.

Results: The mean JAMA score was 1.32±1.11, modified DISCERN score was 2.18±1.02, and coverage score was 5.43±2.97. A moderate positive significant correlation was found between the JAMA and coverage scores (r=0.376, p=0.007), as well as between DISCERN and coverage scores (r=0.356, p=0.011) and between JAMA and DISCERN (r=0.539, p<0.001). Among the 50 videos examined, 26 were published by physicians, yet only 2 videos scored 4 points on the JAMA scoring. The mean coverage score for the 50 videos, rated out of 20 points, was only 5.43. No significant effect of whether the publisher was a physician on JAMA, DISCERN and coverage scores was found (p = 0.233, p = 0.690 and p = 1.000, respectively)

Conclusions: English YouTube videos on chondrosarcoma fall below the ethical and quality standards needed. We believe that the observation of these low scores, especially from a predominantly physician publisher population, warrants particular attention.

Keywords: YouTube, Internet, chondrosarcoma, reliable information.

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INTRODUCTION

Chondrosarcoma is a malignant bone tumor originating from chondrocytes that produces cartilage tissue. It ranks second among primary malignant bone tumors, following osteosarcoma (1). The incidence rates are similar between men and women (male/female ratio: 1.4/1). It is most commonly seen in individuals over the age of 50, with the typical age range being 40 to 75 years (2,3).

Early diagnosis and treatment of musculoskeletal tumors are very important for the prognosis of the disease. Regular and appropriate follow-up of patients after treatment is necessary for the prevention and early detection of possible recurrences. During this process, it is of great importance that healthcare professionals have sufficient knowledge and that patients are made aware of their diseases. Correct diagnosis, effective treatment and a successful follow-up process can only be achieved with this awareness and cooperation.

Social media has become one of the most common sources for learning about diseases and health issues today. People turn to social media content to learn about disease symptoms, treatment methods, and health-related developments (4). Today, although social media provides quick access to health information, it unfortunately causes the spread of unreliable and misleading information. Especially exaggerated, unscientific or incorrect information about diseases and treatment methods can make it difficult for patients to make decisions and can cause them to turn to the wrong treatment methods (5-8).

As of 2024, YouTube has reached 2.5 billion users, making it the second most popular social media platform after Facebook. With this characteristic, it has become the second most widely used social media platform in the market following Facebook (9). Due to the lack of any scientific verification mechanisms and the ability for all users to upload videos, it is clear that the platform is highly susceptible to information pollution, which significantly facilitates the spread of misinformation. The hypothesis of this study is that the quality of YouTube video content related to chondrosarcoma is insufficient. The aim of this study was to assess the quality and accuracy of the information presented about chondrosarcoma on the online video platform YouTube.

MATERIALS AND METHODS

No human or animal subjects were used in this study. No ethics committee approval is required for this study.

This study was a cross-sectional evaluation of internet-based video media. In June 2024, a search for the term "chondrosarcoma" on YouTube was conducted, and the top 50 most viewed English-language videos ranked by relevance were assessed. After the first 50 most-watched videos, there was a noticeable drop in the view counts of the subsequent videos, so the study was limited to 50 videos. The publication dates of the videos ranged from February 2012 to June 2024. Two independent authors (YEK, IK) observed the videos separately. Non-English videos, as well as those related to animals or created by veterinarians, and videos that consisted solely of animation, audio, or subtitles were not included in the study.

Video Quality Analysis

The criteria noted were: web link, title, view count, duration, publication date, number of likes and comments, publisher (physician, non-physician healthcare professional, patient, commercial, other), and content (educational, surgical technique, patient experience, advertisement, other). The reliability and validity of the videos were assessed using the modified DISCERN criteria for YouTube, along with the Journal of the American Medical Association (JAMA) criteria (10-12). The JAMA criteria evaluate the videos objectively, considering authorship, sources, copyright, and timeliness. Two separate observers applied the JAMA criteria to all the videos. Each criterion could receive a score of 1 or 0. The maximum JAMA score for a video is 4, while the minimum is 0. A higher score indicates better quality and reliability of the video. DISCERN criteria modified by Singh et al. for YouTube. It is a 5-question reliability assessment that evaluates the reliability and completeness of health information. Each question is scored 1 or 0, with a maximum score of 5 and a minimum score of 0. A higher score reflects the reliability and completeness of the video. Two separate observers applied the modified DISCERN criteria to all the videos.

DISCERN criteria modified by Singh et al. for YouTube. It is a 5-question reliability assessment that evaluates the reliability and completeness of health information. Each question is scored 1 or 0, with a maximum score of 5 and a minimum score of 0. A higher score reflects the reliability and completeness of the video.

The coverage score is based on a scoring system that has been adjusted according to the literature from previous studies and tailored by us according to the nature

of the disease (Table 1) (13). It consists of criteria that can receive scores of 0.5 or 1, with a maximum of 20 points and a minimum of 0. A higher coverage score is associated with sufficient coverage and reliability of the videos. The evaluation results of both observers were mean to determine the exact measurements. All videos included in the study are publicly accessible. There are no participants in the study. Ethical approval was not obtained as this method has been used in previous studies observed in the literature.

Table 1. Coverage score

Symptoms	1
Impacts on daily life	1
Etiology	1
Risk factors	1
Pathophysiology	1
Non-surgical treatment options	(maximum 2 points)
Conservative	0.5
Chemotherapy	0.5
Radiotherapy	0.5
Other unsubstantiated information	1
Surgery options	1
Imaging, radiography, examinations	1
Prognosis	1
Preoperative preparation	1
Explanation of the surgical technique to be applied	1
During surgery	
Will an implant be applied?	1
Will a graft be applied?	1
Purpose of surgery	1
Talking about non-surgical treatment	1
Ensuring biomechanics	1
After surgery	(maximum 3 points)
Mobilization and physiotherapy process	1
Functional outcome expectation	1
Possible complications	
Limited range of motion, stiffness in joints	0.5
Relapse	0.5
Residue	0.5
Fracture	0.5
Infection and wound problems	0.5
Implant failure	0.5

Statistical Analysis

All data were processed using IBM SPSS Statistics 19 (IBM Corp., Armonk, NY, USA) software. Inter-observer reliability for the JAMA, DISCERN, and coverage scores was good (correlation coefficients: 0.89; 0.84; 0.83). Descriptive statistics included mean, standard deviation, percentage, minimum, and maximum values. In the evaluation of independent groups in categorical variables, Pearson Chi-Square test and Fisher's exact test were performed. The relationship between variables and evaluation scores was tested using Pearson correlation. A significance level of $p \leq 0.05$ was considered statistically significant at a 95% confidence interval. Accordingly, $p \leq 0.05$ indicated a weak relationship ($r=0.16$-0.30), a moderate relationship ($r=0.30$-0.50), and a strong relationship ($r \geq 0.50$).

RESULTS

The descriptive statistics of the videos and the evaluated criteria are presented in the Table 2. These include view count, total video duration, video age, number of likes and comments, JAMA scores, modified DISCERN scores, and coverage scores. The mean JAMA score was 1.32±1.11, the mean modified DISCERN score was 2.18±1.02, and the mean coverage score was 5.43±2.97. Fifty-two percent of video publishers are physicians. Seventy-two percent of the videos are published for educational purposes, while 14% are related to patient experiences and 14% are advertisements.

Table 2. Descriptive statistics for the search terms "chondrosarcoma" and "chondrosarcoma tumor."

	Minimum	Maximum	Mean	Standard deviation
View count	21	32000	4120.94	7164.83
Duration (minutes)	0.3	83	13.07	20.080
Likes	0	206	33.94	48.790
Comments count	0	24	3.36	5.120
JAMA	0	4	1.32	1.110
Modified DISCERN	0	5	2.18	1.020
Coverage score	1	13	5.43	2.970

The relationship between the JAMA, modified DISCERN, coverage scores, and the number of videos is presented in the Table 3. Only 2 videos achieved the maximum JAMA score of 4 points. Five videos received 3 points, while 14 videos scored 0 points. From the modified DISCERN criteria, only 1 video attained the maximum score of 5 points, while 62% of the videos received 2 points. No video achieved the maximum coverage score of 20 points; only 1 video reached 13 points. The minimum coverage score was 1. The mean coverage score was 5.43 (standard deviation: 2.978).

Table 3. Frequency distribution of video evaluations related to Journal of the American Medical Association (JAMA) Score, Modified DISCERN, coverage score, publisher, and purpose for the search terms "chondrosarcoma" and "chondrosarcoma tumor."

	Score	Video count	Frequency (%)
JAMA	0	14	28
	1	15	30
	2	14	28
	3	5	10
	4	2	4
Modified DISCERN	0	3	6
	1	8	16
	2	20	40
	3	16	32
	4	2	4
	5	1	2
Coverage score	≤5	30	60
	5.1-10	16	32
	10.1-15	4	8
	>15	0	0
Publisher	Physcian	26	52
	Healthcare personel	7	14
	Patient	1	2
	Commercial	3	6
	Other	13	26
Purpose	Educational	36	72
	Patient experience	7	14
	Advertising	7	14

A moderate positive and significant relationship was found between the JAMA score and the coverage score (r=0.376, p=0.007). A moderate positive and significant relationship was also found between the DISCERN score and the coverage score (r=0.356, p=0.011). Additionally, a moderate positive and significant relationship existed between the JAMA and DISCERN scores (r=0.539, p<0.001). The relationship between the JAMA score, modified DISCERN score, coverage scores and view counts, likes, comments count, duration, and purpose of the videos are given in Table 4.

Table 4. Association of video assessments with Journal of the American Medical Association (JAMA) Score, Modified DISCERN, and coverage scores

		View counts	Duration (minutes)	Purpose	Likes	Comments count
JAMA	Pearson Correlation (r) p	0.070 0.629	-0.047 0.746	-0.270 0.58	-0.010 0.946	-0.079 0.607
Modified DISCERN	Pearson Correlation (r) p	0.209 0.145	-0.151 0.294	*-0.433* *0.002*	0.084 0.572	-0.264 0.079
Coverage score	Pearson Correlation (r) p	0.186 0.197	0.204 0.156	-0.089 0.541	0.135 0.359	0.127 0.407

When the relationship between publisher and JAMA score, modified DISCERN and coverage scores was evaluated, no significant effect of whether the publisher was a physician on JAMA, DISCERN and coverage scores was found (p = 0.233, p = 0.690 and p = 1.000, respectively) (Table 5).

Table V. Relationship between publisher and Journal of the American Medical Association (JAMA) Score, Modified DISCERN, and coverage scores

	JAMA Mean±SD	**Modified DISCERN** Mean±SD	**Coverage score** Mean±SD
Physician	1.54±1.1	2.46±0.98	5.54±2.86
Others	1.08±1.1	1.88±0.99	5.31±3.15
Statistical analysis*	p= 0.233	p= 0.690	p= 1.000

DISCUSSION

The most significant finding of this study is that the YouTube videos in English, which is the most widely used language in the world, concerning chondrosarcoma the second most common primary malignant bone tumor are dramatically low in quality and unreliable. As a leading source for video searches, YouTube is frequently used as an information source today. The dissemination of incomplete and inaccurate information from such an important resource can lead to misguidance for patients.

In the literature, there are studies addressing the low-quality standards of videos in the Turkish language (14). However, in this study, by examining videos in English, we have demonstrated that this issue of informational quality is a universal problem.

A review of the literature reveals various studies related to the quality assessment of YouTube videos concerning pathologies in the field of orthopedics and traumatology (15–22). In a study, it was emphasized that YouTube videos about pediatric elbow fractures were quite informative in terms of information and content quality. (15). However, other existing studies in the literature indicate that YouTube videos are generally inadequate regarding reliability and educational quality (16–22). This situation increases the risk of individuals seeking health information being exposed to incorrect or misleading information and raises serious questions about the effectiveness of these videos in health education.

Although there are studies related to this topic in the field of orthopedics in the literature, there are limited studies assessing the content quality and reliability of YouTube videos concerning musculoskeletal tumors (23,24). A study evaluating the quality of YouTube videos about bone tumors reported that videos uploaded by doctors had significantly higher view counts, like counts, and JAMA scores compared to videos uploaded from other sources. However, it was found that the majority of YouTube videos about bone tumors had low content quality (25). In our study, the mean JAMA score was 1.32±1.11, the mean modified DISCERN score was 2.18±1.02, and the mean coverage score was 5.43±2.97. These scores, out of 4.5 and 20 respectively, are considered quite low. The low JAMA and DISCERN scores indicate that both the quality and reliability of videos about chondrosarcoma are inadequate. This situation reveals that chondrosarcoma content shared on YouTube is far from scientific accuracy and that patients are likely to encounter incomplete and incorrect information. Although JAMA and modified DISCERN scores were higher when the video publisher was a physician, there was no statistical difference. This indicates that even when content is produced by a physician, the quality of the content remains low. This is one of the most striking findings of our study. We observe that the oversight of information provided online about chondrosarcoma is inadequate, even among physicians.

In the literature, various findings have been presented regarding the view counts, likes, and comments on videos based on content quality. Some studies indicate that there is no correlation between content quality and the number of views or likes (15,24). Conversely, some studies show that high-quality content generally receives more likes or views, while there are also studies reporting that low-quality videos receive more likes or have higher view counts (23,25,26). In our study, however, no significant relationship was found between the JAMA score, modified DISCERN score, coverage score, and the number of views, likes, or comments on the videos. This shows that the content quality and reliability of the videos do not directly affect user engagement. Titles, narrative style, visuals or the fact that the videos are shared by popular content producers may affect the number of views and likes of the videos. In addition, since users have different health literacy, more interesting or understandable videos may be preferred over scientifically based content.

In our study, no video reached the maximum coverage score of 20 points. The low mean coverage score of the videos (5.43) shows how monotonous and incomplete the videos are in terms of content. This shows that the videos on YouTube about chondrosarcoma are generally superficial and inadequate in providing comprehensive information to the viewers. The limited content of the videos can make it difficult for patients and healthcare professionals to access reliable and detailed information. In particular, the incomplete or one-sided content of diseases that require a multidisciplinary approach can lead to misunderstandings and misinformation. Therefore, it is of great importance to prepare videos about health in a way that is more comprehensive, scientifically accurate and more useful in terms of patient education. This observation is supported by the

existing literature. In a study conducted in 2019 on how thyroid cancer patients use the internet, many patients expressed that they found insufficient information regarding issues related to survival, prognosis, and other concerns. The study also noted that patients typically consumed the top-ranking sources in their search engines, highlighting that the prominence of these sources was not necessarily related to their reliability or relevance. Additionally, it was pointed out that more than half of the information available online was outdated or lacked author attribution, leading to a low level of reliability. It can be anticipated that in environments with lower socioeconomic levels, information conflicts may lead to higher levels of dissatisfaction (27).

The literature indicates that the primary reasons cancer patients turn to online research include their inability to obtain information beyond clinical aspects from their doctors or healthcare teams, their curiosity about recurrence and treatment side effects, and a lack of understanding of how the illness will affect them, including the psychological and emotional dimensions of their condition. Some patients have reported that this lack of information is the most challenging aspect of coping with cancer. Differences in information from online sources and healthcare providers can lead to confusion or conflicts (27).

Patients have reported that their two main reasons for seeking information online are dissatisfaction with the information provided by healthcare professionals and a desire to learn everything available. Consequently, their expectations from healthcare providers change. In this context, it can be anticipated that the incomplete or incorrect information that chondrosarcoma patients can obtain from YouTube may negatively affect their attitudes toward doctors. Additionally, the literature indicates that patients find the information obtained from the internet to be confusing and conflicting. As patients present to doctors with incorrect or incomplete information and discuss these issues, doctors may feel that their knowledge is being questioned or that they are being threatened. Moreover, the misrepresentation of advancements in healthcare online can lead to unrealistic expectations regarding treatment among patients. This complicates the doctor-patient relationship and increases conflicts. It is noted that the limited time available during consultations plays a significant role in informing patients. Therefore, the already restricted time becomes even more limited when providing information to a biased patient who has previously obtained incorrect and incomplete information from the internet, negatively impacting the quality of healthcare services (28).

Patients have been observed to be more inclined to self-diagnose and seek treatment for themselves based on the information they obtain from the internet. This suggests that the inadequacy in the content of the chondrosarcoma videos we examined could create significant problems. Additionally, it has been noted that patients who come to consultations after researching information online tend to request alternative treatment methods more frequently. When the information and treatments they acquire through their internet research do not align with what their doctors provide, their trust in healthcare professionals is shaken, leading to dissatisfaction with the healthcare services they receive. These circumstances may drive patients to seek a second opinion by changing doctors or hospitals, or to attempt self-treatment based on the information they have gathered (29).

This study has some limitations. Since YouTube is a dynamic platform, new videos are constantly being added, and the number of comments, views, and likes continuously changes. Our results do not reflect the content of all YouTube videos related to chondrosarcoma. However, by selecting the 50 most frequently returned videos from the search for the keyword “chondrosarcoma,” we believe we have identified the videos most viewed by patients. Since there are currently no objective tools to evaluate the quality and accuracy of video content, subjective scoring criteria were used for the assessment. Despite these limitations, we believe that our results provide valuable insights into the quality and educational content of the most viewed YouTube videos related to chondrosarcoma.

In conclusion, the overall quality and reliability scores of YouTube videos related to the diagnosis and treatment of chondrosarcoma are low. Publishers should provide videos with high accuracy content supported by more comprehensive and up-to-date literature regarding diagnoses and treatments.

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Abbreviations list

JAMA: Journal of the American Medical Association

Ethics approval and consent to participate

No human or animal subjects were used in this study. No ethics committee approval is required for this study.

Consent for publication

There is no data on any individual in our study.

Availability of data and materials

The data that support the finding of this study are available from corresponding author upon reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

İK, YEK: Writing – Original Draft, Visualization, , ÖO, RB, MÇ: Writing – Review & Editing, ÖO: Formal Analysis, İK, MÇ:Data Curation, İBA, CU: Supervision, Writing – Review & Editing.

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