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Research Article / Araştırma Makalesi

YouTube does not provide reliable information about glenohumeral osteoarthritis: A quantitative analysis

YouTube glenohumeral osteoartrit hakkında güvenilir bilgi sağlamıyor: Kantitatif bir analiz

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ABSTRACT

Objective: Although less prevalent than other forms, glenohumeral osteoarthritis affects nearly one-fifth of elderly adults. YouTube has emerged as a popular source of health information for patients, but there is growing concern among physicians about the potential for misleading content. Notably, there is a significant gap in the literature concerning the quality of YouTube videos on glenohumeral osteoarthritis. This study aims to address this gap by evaluating educational value of such videos and contribute valuable insights to the credibility of online health information on glenohumeral osteoarthritis.

Materials and Methods: A systematic search of the YouTube database was performed using the following terms: "glenohumeral arthritis", "shoulder arthritis", and "osteoarthritis of shoulder,". To evaluate the reliability, accuracy, and content quality of the videos, DISCERN, JAMA Benchmark and Global Quality Scale (GQS) were used. Correlation of video characteristics with number of views, likes, video duration was examined using the analysis of variance (ANOVA) model. Two-sample t-tests and regression analyses assessed score variations based on video sources. Agreement between reviewers was assessed by interclass correlation coefficient.

Results: A total of 102 videos were included in the study. The mean video duration was 8.7 minutes. The mean number of views was 348 and the viewing rate was 0.25. The mean number of likes was 46.3. The mean DISCERN score was 44.73 (ICC=0.93), mean GQS was 2.59 (ICC=0.87), and the mean JAMA score was 2.5. According to the classification of DISCERN; 13.6% of the videos were very insufficient quality, 45% were insufficient quality, 32.3% were average quality, and 7.8% were good quality. According to the Global Quality Score, 60 (58.9%) videos were rated as poor quality.

Conclusion: Our results demonstrate that the majority of YouTube videos regarding glenohumeral osteoarthritis include insufficient-quality content. Health professionals should recognize these limitations and make a concerted effort to provide higher quality educational content to patients to better improve patient satisfaction and treatment outcomes.

Keywords: *YouTube; glenohumeral osteoarthritis; quality of YouTube videos; patient education*

ÖZ

Amaç: Diğer formlarından daha az yaygın olmasına rağmen, glenohumeral osteoartrit yaşlı yetişkinlerin neredeyse beşte birini etkilemektedir. YouTube, hastalar için popüler bir sağlık bilgisi kaynağı haline gelmiştir, ancak hekimler yanıltıcı içerik potansiyeli konusunda giderek daha fazla endişe duymaktadır. Özellikle, YouTube videolarının glenohumeral osteoartrit üzerine kalitesi konusunda literatürde önemli bir boşluk bulunmaktadır. Bu çalışma, bu boşluğu ele almayı ve glenohumeral osteoartrit üzerine çevrimiçi sağlık bilgilerinin güvenilirliğine değerli katkılarda bulunmayı amaçlamaktadır.

Gereç ve Yöntemler: YouTube veritabanında "glenohumeral artrit", "omuz artriti" ve "omuz osteoartriti" terimleri kullanılarak sistematik bir arama gerçekleştirildi. Videoların güvenilirliğini, doğruluğunu ve içerik kalitesini değerlendirmek için DISCERN, JAMA Referans Kriterleri ve Küresel Kalite Skalası (GQS) kullanıldı. Video özelliklerinin görüntülenme sayısı, beğeni sayısı, video süresi ile korelasyonu varyans analizi (ANOVA) modeli kullanılarak incelendi. Video kaynaklarına dayalı puan varyasyonları iki örneklem t-testleri ve regresyon analizleri ile değerlendirildi. İnceleyenler arasındaki anlaşma, sınıflararası korelasyon katsayısı ile değerlendirildi.

Bulgular: Çalışmaya toplam 102 video dahil edildi. Ortalama video süresi 8.7 dakika idi. Ortalama görüntülenme sayısı 348 ve görüntülenme oranı 0.25 idi. Ortalama beğeni sayısı 46.3'tü. Ortalama DISCERN puanı 44.73 (ICC=0.93), ortalama GQS 2.59 (ICC=0.87) ve ortalama JAMA puanı 2.5 idi. DISCERN sınıflandırmasına göre; videoların %13.6'sı çok yetersiz kalitede, %45'i yetersiz kalitede, %32.3'ü ortalama kalitede ve %7.8'i iyi kalitede idi. Küresel Kalite Skoruna göre, 60 video (%58.9) düşük kalite olarak değerlendirildi.

Sonuç: Sonuçlarımız, glenohumeral osteoartrit ile ilgili YouTube videolarının çoğunluğunun içeriğinin yetersiz kalitede olduğunu göstermektedir. Sağlık profesyonelleri bu sınırlamaları tanımalı ve hasta memnuniyetini ve tedavi sonuçlarını olumlu yönde etkilemek için daha yüksek kaliteli eğitim içeriği sağlama konusunda yoğun çaba göstermelidir.

Anahtar Sözcükler: *YouTube; glenohumeral osteoartrit; YouTube videolarının kalitesi; hasta eğitimi*

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INTRODUCTION

Glenohumeral osteoarthritis (OA) is one of the most common joint diseases (1). Although the actual prevalence of glenohumeral OA is difficult to determine, cross-sectional studies have shown that 16.1% to 20.1% of elderly adults (> 65 years of age) have radiographic evidence of glenohumeral OA (2, 3). The number of surgical procedures has increased dramatically with the widening of indications and improvement of reverse shoulder arthroplasty design, with more than 80.000 cases per year in the United States (4, 5). Such a large patient population needs a reliable information source with increasing internet use, even if physicians have traditionally been the source of medical information.

YouTube is the main source of detailed video content on the internet about health information with millions of hours of views per day and its influence is becoming more evident in younger populations (6). According to studies, over the half of adults regularly use the internet to learn about health issues, and 80% have searched for medical information online at least once in developed countries but most of these patients do not even discuss the information they get from the internet with their physicians (7, 8).

While patients seek more reliable information about orthopedic diseases and treatments, non-reviewed and low quality YouTube content may affect the patient's expectations and patient-physician interaction (9). Previous studies have shown that YouTube is often a poor source of educational content for conditions such as knee osteoarthritis and carpometacarpal osteoarthritis, with many videos lacking critical information and having low educational value (10, 11). Some physicians expressed their feelings about decreased efficiency of their visits because of the information obtained by the patients or their relatives and reported concerns about the overall patient management and care process (12). Therefore, the purpose of this study was to evaluate the educational quality of YouTube videos regarding glenohumeral osteoarthritis.

MATERIAL and METHODS

Study Design and Video Selection

A standard search was conducted using YouTube's online library (www.youtube.com) with the following search terms: "glenohumeral arthritis", "shoulder arthritis", and "osteoarthritis of the shoulder," on January 18, 2023. A new personal account with cleared cookies and cache was used. The first 50 videos using each search term were queried. Videos in English, content related to shoulder osteoarthritis and of good audiovisual quality were included. The primary reason for excluding Turkish videos is to ensure language consistency and accessibility for an international audience, aligning with the study's goal of reaching a broader academic and clinical readership. Repetitive videos, audio - or visual-only videos, videos in a non-English language, videos that did not address glenohumeral osteoarthritis, news/drama videos and videos focused solely on physical therapy were excluded to ensure that the content comprehensively addressed the medical and surgical aspects of glenohumeral osteoarthritis, rather than just therapeutic exercises. Videos less than one minute in length were also excluded.

Video Creators

The videos included in the study were created by a variety of sources, including orthopedic doctors, physiotherapists, healthcare organizations, and educational channels, ensuring a diverse range of perspectives on the topic.

Data Collection

The following data were collected from each video that met inclusion/exclusion criteria: number of views, duration, content type, number of days since upload, video source/uploader, view rate (views/days), and number of 'likes'. Video sources and uploaders were classified as academic (physicians or health professionals affiliated with university or research groups), health information (physicians without any affiliation) and medical advertising companies (non-physicians).

Video Analysis

Video reliability was conducted by two independent authors (initials blinded for peer-review) and evaluated using the Journal of the American Medical Association JAMA criteria, DISCERN questionnaire, and the Global Quality Score (GQS). The JAMA criteria, scored from 0 to 4, evaluate the video's reliability and accuracy, with a lower score indicating lower reliability. The criteria include authorship, attribution, disclosure, and accuracy (13). The DISCERN questionnaire, consisting of 16 questions, examines the quality of health information resources by evaluating features such as clarity of aims, relevance of information, and balanced presentation of treatment options (14). The GQS utilizes a 5-point scoring system to assess the overall quality of the video content, with a maximum score of 5 indicating high quality (9, 15).

Statistical analysis

Data were analyzed using IBM SPSS v.20 (Armonk, NY, USA). Frequency (n) and percentage was used to report categorical data such as video classification criteria, while mean values with standard deviation was used for continuous data. Shapiro-Wilk test was used to investigate normal distribution. Mann-Whitney U test was preferred where the-

med with the agreement between two reviewers using interclass correlation co-efficient. Spearman correlation test was used to assess the correlation between quantitative variables. The statistical significance threshold was set at $p<0.05$.

RESULTS

A total of 150 videos were initially found. Of these, 31 duplicate videos, 12 non-English videos, and 5 videos that did not contain audio were excluded. A total of 102 videos met the inclusion criteria and were included in the final analysis **(Figure 1)**. The videos had a mean duration of 8.72 ± 2.08 minutes, a mean number of views of 348 ± 187, 1537 ± 941 days since initial upload, and a mean views ratio of 0.247 ± 0.034. Video characteristics are reported in **Table 1.**

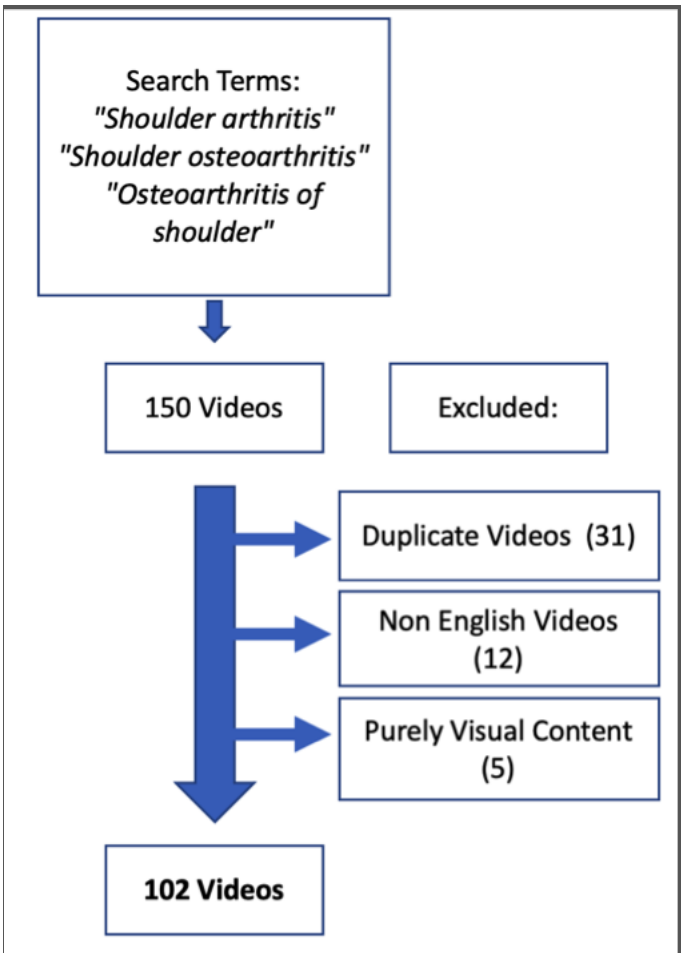

Figure 1. Algorithm for the inclusion criteria of the YouTube videos

Table 1. Detailed Analysis of YouTube Video Metrics Related to Glenohumeral Osteoarthritis

Characteristics	Mean ± SD	Minimum	Maximum
Video Duration (min.)	8.72 ± 2.1	1.3	15.6
No. of Views	348 ± 187.4	83	3641
Days since upload	1537 ± 941	111	4988
View ratio	0.25 ± 0.03	0.008	78.4
No. of Comments	11.6 ± 14.3	0	83
No. of Likes	39.4 ± 26.8	0	4239

The majority of the videos were uploaded from University channels/health professionals (79%), while non-professional health information websites (12%) and medical advertisement/profit companies (9%) made up only a small portion of the total videos **(Figure 2)**. No significant differences existed in the quantitative scores between the sources of the videos **(Table 2)**. The interobserver agreement between two observers were excellent for DISCERN and good for GQS and JAMA **(Table 3)**. DISCERN scoring system revealed that 13.6% of the videos were very insufficient, 45% were insufficient, 32.3% were average, and 7.8% were good. The overall DISCERN score (43.5) showed a fair performance, indicating an insufficient information quality. Overall GQS (2.55) and JAMA (2.93) scores were at poor and moderate level **(Table 4)**. No correlation was found between DISCERN, GQS and JAMA scores. A significant correlation between the number of comments and DISCERN and GQS scores was found ($p<0.001$, rho: 0.979, rho: 0.914, respectively). Number of 'likes' were significantly correlated with GQS score ($p<0.001$, rho: 0.973) **(Table 5)**.

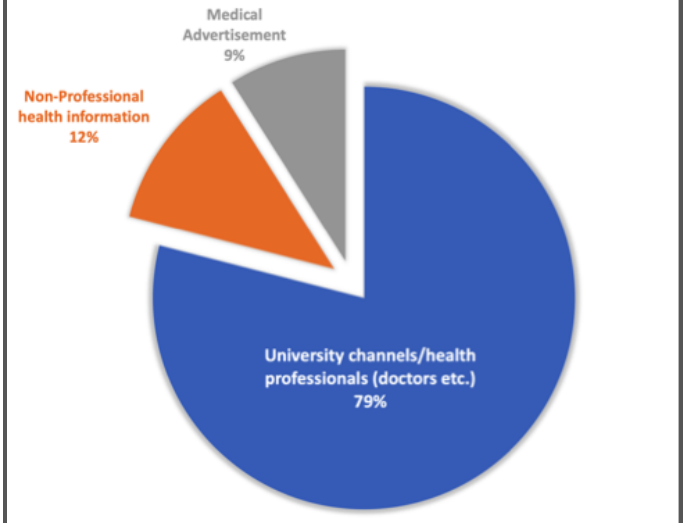

Figure 2. Distribution of videos based on video sources and uploaders

Table 2. Statistical relationship of DISCERN, GQS and JAMA scores from different video sources.

	DISCERN	GQS	JAMA
University channels/health professional's vs Non-professional health information websites.	43.2 vs 37.4 p=0.176	2.6 vs 2.2 p=0.342	3.1 vs 2.8 p=0.533
University channels/health professional's vs Medical advertisements/profit companies.	43.2 vs 34.6 p=0.055	2.6 vs 2.15 p=0.376	3.1 vs 2.6 p=0.641
Non-professional health information web sites vs Medical advertisements/profit companies.	37.4 vs 34.6 p=0.456	2.2 vs 2.15 p=0.143	2.8 vs 2.6 p=0.312

JAMA, Journal of the American Medical Association; GQS, Global Quality Score

Table 3. Interobserver agreement assessments based on the scoring systems

Criteria	*Observer*	*Average*	*SD*	*Median*	*Min.*	*Max.*	*ICC (%95 CI)*
GQS	1	2.59	0.68	2	1	5	0.871
	2	2.50	0.66	2	1	5	
DISCERN	1	44.73	10.71	39	18	63	0.937
	2	42.18	10,12	38	19	64	
JAMA	1	2.82	0.49	3	1	4	0.862
	2	3.03	0.53	3	1	4	

JAMA, Journal of the American Medical Association; GQS, Global Quality Score; SD, Standard Deviation; Min., Minimum; Max., maximum; ICC, Intraclass Correlation Coefficient, CI, Confidence Interval

Table 4. Video quality according to the DISCERN, GQS and JAMA scoring systems.

Scoring System	Number of videos
DISCERN	
<26 Very poor	14 (13,6%)
27-38 Poor	46 (45%)
39-50 Fair	33 (32,3%)
51-62 Good	8 (7,8%)
63-75 Excellent	1
GQS (1-5 points)	
Low content quality (1 or 2 points)	61 (59%)
Intermediate content quality (3 points)	36 (35,2%)
High content quality (4 or 5 points)	5 (4,9%)
JAMA (1-4 points)	
Insufficient data (1 point)	32 (31,4%)
Partially sufficient data (2 or 3 points)	64 (62,7%)
Completely sufficient data (4 points)	6 (5,9%)
	Total = 102

Table 5. Correlations of quantitative variables and scores.

	DISCERN (p; rho)	GQS (p; rho)	JAMA (p;rho)
Video Duration	0.671; 0.289	0.423; 0.541	0.483; 0.535
View Ratio	0.012; -0.329	0.851; 0.134	0.612; 0.312
Likes	0.032; 0.134	<0.001*; 0.973	0.039; 0.77
Comments	<0.001*; 0.979	0.005*; 0.914	0.143; 0.896

P-value; rho=Spearman's rho; *, p<0.05

DISCUSSION

This study showed that YouTube contents about glenohumeral arthritis are not sufficient enough for patient education and cannot meet the increasing demand of knowledge in this particular disease. Our results are consistent with the current literature, as most studies report insufficient quality of videos on the internet about different orthopedic diseases (9, 10, 16). Notably, none of the mean scores in this study reached high-quality standards, even though included videos were mainly from health professionals. This could be explained by the existence of different etiologies and treatment algorithms of glenohumeral arthritis (idiopathic, traumatic, rotator cuff arthropathy, avascular necrosis etc.) so that the narrator in the videos could not go into every detail of the disease. However, disease conditions with less popularity, and a lower variety of etiologies and treatment strategies were mostly evaluated by healthcare professionals on YouTube and these videos tend to have higher scores. For example, a new study regarding elbow fractures in children reported high-quality educational videos (17). Furthermore, Heisinger et al. also reported moderate to good quality scores regarding transforaminal lumbar interbody fusion videos, which is fairly a specific topic for laypersons (18). Similar findings were observed in Instagram videos, where a study found that most videos about ACL surgery focused on surgical techniques, with less emphasis on injury prevention and complications, highlighting a gap in comprehensive educational content (19). Additionally, study on hip arthritis have demonstrated that YouTube often provides poor-quality information for diagnosis and treatment, emphasizing the need for accurate educational videos (20).

We could not find any statistical difference in terms of quality scores between different video sources such as health professionals vs. non-professional/medical advertisement websites. This finding differentiates our study from similar studies that reported better educational quality of the videos from health professionals (21-23).

The view numbers of the included videos were lower (mean: 348) compared with the view rates in different studies evaluating sports injuries or more popular contents (knee osteoarthritis, anterior cruciate ligament injury etc.). The reason might be the older patient group of glenohumeral arthritis that is less likely to use the internet comprehensively. It is also known that higher-quality videos are viewed less by internet users (24, 25). The interobserver correlation for DISCERN, JAMA and GQS scores were good, increasing the value of the interpretation of the study.

Based on the findings of this study, there should be a standardized and peer-reviewed video source about different diseases so that people around the world can easily access high-quality and current information. Preparing informative videos under the guidance of the World Health Organization and relevant associations (i.e. Orthopedics and Traumatology) in all languages may eliminate the confusion of information on the internet. Furthermore, the inclusion of other for-profit and social media websites highlights the persistent challenge of low-quality educational information in patient education and care.

This study has limitations. First, a single search engine (YouTube.com) was utilized at a single time point. This limits the generalizability of resources used and accessed among patients. Secondly, the scoring systems used in the study were not validated, however, they are the mostly used in the literature. While the study focused on the medical and surgical aspects of glenohumeral osteoarthritis, it identified a gap in content related to the return to social life and the detailed physical therapy process. Future research should explore these areas to provide a more comprehensive understanding of patient rehabilitation and social reintegration. Furthermore, we were not able to analyze non-English videos. Other non-English language videos may provide higher quality studies, thus, future studies should further evaluate study quality in numerous languages.

CONCLUSION

Our results demonstrate that the majority of YouTube videos regarding glenohumeral osteoarthritis include insufficient-quality content. Health professionals should recognize these limitations and make a concerted effort to provide higher quality educational content to patients to better improve patient satisfaction and treatment outcomes.

Ethics Committee Approval / Etik Komite Onayı

Ethics approval was not required for this non-interventional study

Conflict of Interest / Çıkar Çatışması

The authors declared no conflicts of interest with respect to authorship and/or publication of the article.

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Author Contributions / Yazar Katkıları

Concept: MK, GH; Design: MK, UCK, GA; Supervision: FF, GJ, GA; Materials: TA, UCK; Data Collection: TA, UCK; Analysis: MK, TA, UCK; Literature Review: MK, UCK, GA; Writing Manuscript: MK, UCK, GA; Critical Reviews: FF, GJ. All authors contributed to the final version of the manuscript and discussed the results and contributed to the final manuscript.

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