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Evaluating the quality and reliability of YouTube videos on Achilles tendinopathy: a comprehensive analysis

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ABSTRACT

Aims: This study evaluates the quality, reliability, and educational value of YouTube videos on Achilles tendinopathy.

Methods: A YouTube search using the keyword "Achilles tendinopathy" was conducted on June 20, 2024, using an incognito browser tab. The first 50 English-language videos were analyzed for upload date, duration, views, likes, dislikes, comments, and categorized by source and content. The DISCERN score, Global Quality Score (GQS), and Journal of the American Medical Association (JAMA) score were used to assess video quality and reliability. Statistical analyses included the Shapiro-Wilk test, Kruskal-Wallis test, Mann-Whitney U test, and Spearman test for correlations.

Results: Among 50 videos, the average DISCERN score was 42.5, GQS was 3.2, and JAMA score was 2.6, indicating moderate overall quality. Academic physician videos had higher scores. Exercise training videos scored significantly higher in quality assessments. The highest Video Power Index (VPI) was also found in videos by academic physicians.

Conclusion: YouTube videos on Achilles tendinopathy provide moderately sufficient information, with higher quality in videos produced by academic physicians and those focusing on exercise training. The study suggests a need for standardized, high-quality educational content on online platforms.

Keywords: Achilles tendon, tendinopathy, YouTube, quality, reliability

INTRODUCTION

In today's digital age, the accessibility and abundance of information through the Internet have dramatically transformed how individuals seek and consume health information. The Internet's role as a primary source for health-related data continues to expand exponentially.[1] Recent surveys indicate that over half of patients actively use the Internet for medical inquiries, with 60% of these individuals finding the information comparable to, or even superior to, that provided by healthcare professionals.[2] Moreover, recent studies have shown that approximately 80% of Internet users seek health-related information online, with a notable 30% of orthopedic patients researching their conditions on the web.[3] These trends highlight the growing reliance on digital platforms as essential tools for patient education and decision-making in healthcare.

Among chronic patients, 75% reportedly turn to online resources just before finalizing treatment decisions.[4] In this context, video-based materials have gained significant traction, as they are often perceived as more engaging and accessible than traditional text-based content. Consequently, platforms like YouTube have emerged as dominant sources of health-related information.[5] High-quality video content has been shown to improve patient outcomes by enhancing comprehension and understanding of medical conditions.[6] Since its launch in 2005, YouTube has evolved into a global platform, boasting 120 million daily active users and over 2.5 billion monthly active users, making it a critical resource for patient education.[7] However, despite its widespread use, YouTube's lack of peer-reviewed processes or standardized quality control for health-related videos presents significant risks. The absence of quality assurance mechanisms often

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results in the dissemination of poor-quality, inaccurate, or incomplete information, potentially misleading patients and impacting treatment outcomes.[8–11]

The Achilles tendon, the strongest and largest tendon in the human body, is particularly susceptible to both degenerative and traumatic injuries.[12] Achilles tendinopathy, a prevalent orthopedic condition resulting from overuse and microtrauma, is characterized by pain, swelling, and functional impairment. It disproportionately affects athletes as well as middle-aged, overweight, and sedentary individuals, with the Achilles tendon accounting for approximately 20% of all tendon injuries.[13,14] There are two main subtypes of Achilles tendinopathy-insertional and non-insertional-each with distinct pathophysiological mechanisms and treatment protocols, ranging from conservative management to surgical intervention. While most patients experience a favorable prognosis with appropriate care, effective management remains critical in preventing chronic disability.[15]

Considering the growing incidence of Achilles tendinopathy in younger, more internet-savvy populations, it is essential to evaluate the quality and reliability of online video content pertaining to this condition. Despite several studies analyzing the accuracy of YouTube videos across various medical topics, no previous research has systematically assessed the quality and educational value of videos specifically related to Achilles tendinopathy. This study, therefore, seeks to fill this gap by evaluating the reliability, educational content, and overall quality of YouTube videos on Achilles tendinopathy. We hypothesize that, similar to findings from studies on other orthopedic conditions, the quality and reliability of YouTube videos on Achilles tendinopathy are likely to be inadequate or incomplete.

METHODS

This study was exempt from ethical approval due to its observational design, utilizing only publicly available videos. All procedures were carried out in accordance with the ethical rules and the principles.

A search using the keywords 'Achilles tendinopathy' was conducted on YouTube (http://www.youtube.com) on June 20th, 2024, in Ankara, Turkiye. After logging out of all Google and YouTube accounts, Google Chrome (Google LLC, Mountain View, CA) incognito tab was used to eliminate confounding factors, conducting the search in a browser with no history or cookies, and without altering YouTube search options or applying any filters. Studies of user behavior in internet search engines have shown that over 90% of users focus on the results within the first three pages.[16] Therefore, the videos were sorted by the default 'relevance' filter, and only the first 50 videos were recorded for evaluation. Only videos in English were included in the study. Excluded were videos unrelated to Achilles tendinopathy, those in non-English languages, advertisements, silent content, videos shorter than 30 seconds, and duplicates. If these criteria were met, the next acceptable video was recorded and evaluated. This descriptive study examined publicly available videos on the internet and did not involve any human participants or animals. Therefore, it was exempted from institutional review by our ethics committee as it only involved the use of public access data, consistent with similar studies in the literature.[17,18] No patient information was used, so patient consent was not obtained.

Video Characteristics

For each video, the following characteristics were extracted: upload date, video duration, number of views, number of comments, number of likes, and number of dislikes. From these values, the days since upload, view ratio (number of views/days) and like ratio (like × 100 / [like + dislike]) were calculated. The video power index (VPI) was calculated as the like ratio × view ratio / 100, a method developed by Erdem and Karaca in their examination of the quality of YouTube videos on kyphosis.[19] The VPI, validated in multiple orthopedic studies, serves as a quantitative index to gauge video popularity, as YouTube does not provide such a metric.[9,20] Videos were categorized based on their creators into four groups: (1) academic physician (linked to research institutions, universities, or colleges); (2) nonacademic physician (independent or associated with physician groups without university or research affiliations); (3) nonphysician/trainer (health professionals like physical therapists and athletic trainers); and (4) other (patient-generated content, medical information, or animations from educational or health websites). Videos were also classified based on their content into the following categories: (1) disease-specific information; (2) surgical techniques or approaches; (3) nonsurgical management; (4) exercise training; and (5) patient experience.

Video Quality, Reliability, and Accuracy of Content

The DISCERN score, global quality score (GQS), and Journal of the American Medical Association (JAMA) score were utilized to assess the quality, reliability, and accuracy of the videos.[9,21,22] Two senior orthopedic and traumatology surgeons independently evaluated the videos using these scoring systems. Their scores were then summed and averaged to determine the final DISCERN, GQS, and JAMA scores. The DISCERN score evaluates information quality through 16 questions, each rated from 1 to 5, totaling 16 to 80 points. Scores are categorized as: 63-80 (excellent), 51-62 (good), 39-50 (medium), 27-38 (poor), and 16-26 (very poor) (**Table 1**). The JAMA scoring system assesses video accuracy and reliability using four criteria-authority, quality, clarity, and currency-each rated from 1 to 4 points, with 1 indicating low level, 2 and 3 indicating medium level, and 4 indicating high accuracy (**Table 2**). The GQS scoring system assesses the educational value of videos with five questions, each rated from 1 (low quality) to 5 (excellent quality) (**Table 3**).

Table 1. DISCERN Scoring System

Criteria	Description
Authorship	Authors and contributors, their affiliations, and relevant credentials should be provided
Attribution	References and sources for all content should be listed clearly, and all relevant copyright information noted
Currency	Dates that content was posted and updated should be indicated
Disclosure	Web site "ownership" should be prominently and fully disclosed, as should any sponsorship, advertising, underwriting, commercial funding

Score: 0-4, JAMA: Journal of the American Medical Association

Table 2. Global Quality Score	
	Question
Section 1	**Is the publication reliable?**
1	Are the aims clear?
2	Does it achieve its aims?
3	Is it relevant?
4	Is it clear what sources of information were used to compile the publication (other than the author or producer)?
5	Is it clear when the information used or reported in the publication was produced?
6	Is it balanced and unbiased?
7	Does it provide details of additional sources of support and information?
8	Does it refer to areas of uncertainty?
Section 2	**How good is the quality of information regarding treatment choices?**
9	Does it describe how each treatment works?
10	Does it describe the benefits of each treatment?
11	Does it describe the risks of each treatment?
12	Does it describe what would happen if no treatment is used?
13	Does it describe how the treatment choices affect overall quality of life?
14	Is it clear that there may be more than 1 possible treatment choice?
15	Does it provide support for shared decision-making?
Section 3	**Overall rating of the publication**
16	Based on the answers to all of the above questions, rate the overall quality of the publication as a source of information about treatment choices
Each item is scored from 1 to 5 and then summed	

Table 3. JAMA scoring system	
Score	Description of quality
1	Poor quality, poor flow, most information missing, not useful for patients.
2	Generally poor, some information given but of limited use to patients.
3	Moderate quality, some important information is adequately discussed.
4	Good quality, good flow, most relevant information is covered, useful for patients.
5	Excellent quality and excellent flow, very useful for patients.
Score: 1-5	

Statistical Analysis

Descriptive statistics for video characteristics such as duration, days since upload, likes/dislikes, and comments, as well as views by video source and content categories, were reported as mean, standard deviation (SD), minimum, and maximum. The Shapiro-Wilk test was used to assess normal distribution of the variables. As the parameters did not show a normal distribution, the Kruskal-Wallis test was employed for group comparisons, and the Mann-Whitney U test identified the group causing the difference. Spearman test was used to assess correlations between groups. All scoring systems were independently assessed twice, by two orthopaedic surgeon. Intraobserver and interobserver agreements were determined using intraclass correlation coefficients (ICCs). Statistical significance was considered at $p<0.05$.

RESULTS

In the current study, 50 videos were evaluated, with descriptive statistics provided in Table 4. According to the DISCERN scoring, 8 (16%) videos were of excellent quality, 7 (14%) were of good quality, 23 (46%) were of medium quality, 11 (22%) were of poor quality, and 1 (2%) was of very poor quality. The JAMA score was determined to be low (one point) in 5 (10%) videos, moderate (two or three points) in 22 (44%) videos, and high (four points) in 23 (46%) videos. The GQS score indicated that 1 (2%) video was of poor quality with one point, while 20 (40%) videos were of excellent quality with five points. The mean video duration was 422.4±27.2 seconds (range, 65-1342 seconds). The mean views was 292342.43±745.12. The videos received a mean number of 1931.2±49.5 likes and 82.3±19.6 dislikes, with a mean view ratio of 111.72±24.4. The mean like ratio was 95.8±7.21, and the mean number of days since upload was 1623.5±368.2. The mean VPI was 105.15±23.5. In our assessment of video reliability, quality, and content for all 50 videos reviewed, the overall mean DISCERN score was 42.5±12.3, whereas the mean GQS and JAMA scores were 3.2±1.05 and 2.6±1.1, respectively.

Table 4. Video characteristics				
Characteristic	**Mean**	**SD**	**Min**	**Max**
Video duration (seconds)	422.4	27.2	65	1342
Days since upload	1623.5	368.2	78	4213
Views	292342.43	745.12	1345	2417422
Likes	1931.2	49.5	5	31125
Dislikes	82.3	19.6	0	1853
Comments	92.1	21.3	0	1542
View ratio	111.72	24.4	564	142377
Like ratio	95.8	7.21	3233	7834
VPI	105.15	23.5	292	137124
DISCERN	42.5	8.3	16	75
GQS	3.2	0.8	1	5
JAMA	2.6	0.8	1	5
SD: Standard deviation, Min: Minimum, Max: Maximum, VPI: Video Power Index, GQS: Global Quality Score, JAMA: Journal of American Medical Association				

Table 5 presents the mean and standard deviation values for the DISCERN, GQS, and JAMA scores, as well as the VPI. There was no significant correlation between the video source and VPI, DISCERN, GQS, and JAMA scores ($p>0.05$). However, it was observed that these scores tended to be higher in videos created by academic physicians. Analysis of the relationship between video content and the VPI, DISCERN, JAMA, and GQS scores revealed that exercise training videos had significantly higher scores ($p=0.032$). Analysis of the relationship between VPI and DISCERN, GQS, and JAMA scores found a statistically insignificant and weak correlation ($p>0.05$, Coefficient = -0.10, 0.15, and -0.12, respectively). JAMA results showed a moderate correlation with DISCERN and GQS results ($p<0.05$, Coefficient = 0.650 and 0.620, respectively), while a very strong correlation was observed between DISCERN and GQS results ($p<0.05$, Coefficient=0.975) (Table 6). The intraobserver and interobserver reliability of the two raters was good for the

DISCERN, GQS and JAMA scores (ICC 0.892, 95% CI 0.804 to 0.929).

Table 5. DISCERN, GQS, JAMA and VPI scores according to video source and content

	DISCERN mean±SD	GQS mean±SD	JAMA mean±SD	VPI mean±SD
Video source				
Academic physician	48.5±6.2	3.4±0.6	3.7±0.5	125.5 ±24.2
Non-academic physician	40.2±8.1	3.0±0.7	2.5±0.7	90.4±22.3
Non-physician/trainer	38.5±7.2	2.8±0.9	2.2±0.8	75.3±19.4
Others	35.8±8.0	2.5±0.8	2.0±0.7	60.7±18.5
Video content				
Disease-specific information	43.2±7.3	3.5±0.8	3.2±0.9	105.7±19.5
Surgical techniques	40.1±8.1	2.9±0.7	2.7±0.8	95.3±18.3
Non-surgical management	42.8±7.0	3.2±0.5	2.5±0.6	110.4±22.1
Exercise training	48.6±6.0	3.3±0.5	3.4±0.6	135.6±25.4
Patient experience	37.5±6.5	2.8±0.6	2.4±0.7	85.2±17.6

GQS: Global Quality Score, JAMA: Journal of American Medical Association, VPI: Video Power Index

Table 6. Correlation between scores and VPI

Correlation	Coefficient	p value
DISCERN-GQS	0.975	0.043
DISCERN-JAMA	0.650	0.039
GQS- JAMA	0.620	0.041
VPI-DISCERN	-0.10	0.125
VPI-GQS	0.15	0.212
VPI-JAMA	-0.12	0.174

VPI: Video Power Index, GQS: Global Quality Score, JAMA: Journal of American Medical Association

DISCUSSION

The key finding of this study is that YouTube videos on Achilles tendinopathy generally provide information of moderate quality. While there was no significant correlation between the source of the videos and their DISCERN, GQS, or JAMA scores, it is noteworthy that exercise training videos consistently received higher scores compared to other types of content. This suggests that exercise-focused videos tend to offer more reliable and accurate information. In summary, the study highlights that although the overall reliability, accuracy, and educational value of YouTube videos on Achilles tendinopathy are moderate, exercise training videos stand out for their superior quality.

Nowadays, patients are increasingly relying on online resources for informed decision-making. YouTube's popularity is growing due to its visual appeal and the ease of accessing health information.[5] However, the quality of online information is variable and inconsistent, which can destabilize the clinician-patient relationship due to the lack of a filtering process.[23] Goyal et al.[24] found that 78% of YouTube videos about carpal tunnel syndrome contained at least one misleading statement.[2] Numerous studies have assessed the quality of health-related videos on YouTube. The first study by Keelan et al. [25] evaluated vaccine-related videos and found low-quality scores for various medical conditions. Similarly, studies on hip arthritis, lumbar surgery, anterior cruciate ligament tears, and rotator cuff tears have reported poor quality results.[26,27] In the current study, the mean DISCERN score of 42.5 out of 80 indicates incomplete specific educational content, the mean GQS score of 3.2 out of 5.0 suggests moderate general educational quality with suboptimal to adequate videos, and the mean JAMA score of 2.6 out of 4.0 shows moderate to low reliability and accuracy. It was found that YouTube videos about Achilles tendinopathy contained moderate-quality information, consistent with existing literature, suggesting that standardizing these videos could improve their quality.

Examining existing studies on video sources reveals that the most important factor in obtaining sufficient information is the video source itself, with physician-prepared videos generally having better information quality.[28] However, Dincel et al.[11] found that even though videos about Achilles tendon rupture uploaded by doctors had higher quality scores than those from other groups, they still did not contain sufficient quality information. In our study, the highest VPI scores were for videos by academic physicians, indicating that patients are more interested in these videos.

The findings of this study have important implications for patient care and the use of online health information. As patients increasingly turn to platforms like YouTube, the discovery that Achilles tendinopathy videos generally provide moderately accurate information raises concerns about informed decision-making. While exercise training videos demonstrated higher reliability and educational value, the overall moderate quality of content may lead patients to make treatment decisions based on incomplete or inaccurate information, potentially impacting clinical outcomes. The lack of a peer-review system on YouTube exacerbates the risk of patients accessing misleading content, complicating the clinician-patient relationship when patients come with preconceived, and often inaccurate, notions. Inadequate or partial online information can lead to delays in seeking appropriate care or misinterpretations of treatment options. Therefore, clinicians must engage in discussions with patients about the limitations of online health videos, steering them toward more reliable sources. YouTube could enhance its algorithms to prioritize evidence-based, peer-reviewed content from reputable sources in health-related searches. Furthermore, implementing a verification system that labels high-quality, fact-checked videos with a "trusted content" badge could assist patients in easily identifying reliable resources.

Limitations

There are possible limitations to this study. Firstly, YouTube's dynamic nature means search results can vary. The top results analyzed represent information available on a single day, but these can be influenced by YouTube's search algorithm, which considers user location, search history, and previously viewed videos. Efforts were made to address this by examining the top 50 results, which is more than an average user

would typically search. Secondly, while the evaluation was performed by two orthopedic surgeons, the intraobserver and interobserver reliability of their scores was consistently good. Another limitation of the study is the terminology, as Achilles tendinopathy is also known as Achilles tendinitis and Achilles tendinosis. The term "Achilles tendinopathy" was used because it encompasses both tendinitis and tendinosis. Future studies should incorporate a broader range of search terms including "Achilles tendon pain" and "heel pain". Lastly, a readability analysis of the video transcripts was not conducted. Patient education materials should be at or below a sixth-grade reading level, as recommended by the American Medical Association and the National Institutes of Health. Videos from physician or academic sources likely exceeded this level. Future studies should evaluate the readability of video transcripts to better understand the accessibility of online health information and address gaps in patient comprehension. Moving forward, research should focus on strategies to improve the quality of online health content. One potential direction is the development of standardized guidelines for creating health-related videos, ensuring that they are accurate, reliable, and easily understandable for the general population. Collaboration between healthcare professionals and content creators could help improve the quality and trustworthiness of online resources.

CONCLUSION

This study highlights that YouTube videos on Achilles tendinopathy generally provide moderate-quality information, with academic physician-produced and exercise training videos showing relatively higher standards. However, there remains a need for improvement in the accuracy, reliability, and educational value of online health content. To address this, standardized guidelines should be developed to ensure videos are based on reliable evidence and are peer-reviewed. Promoting greater involvement from physicians in content creation and incorporating readability assessments are also essential strategies for making these videos more accessible and effective for a wider patient audience. These improvements will help enhance patient education, foster better decision-making, and strengthen the clinician-patient relationship.

ETHICAL DECLARATIONS

Ethics Committee Approval

This study was exempt from ethical approval due to its observational design, utilizing only publicly available videos.

Informed Consent

This article did not require informed consent as it did not involve human subjects.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors 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.

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