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**ORIGINAL**

# Analysis of the Achilles Tendon-Related Educational Value of YouTube Videos

## Análisis del valor educativo de los vídeos de YouTube relacionados con el tendón de Aquiles

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## ABSTRACT

The purpose of this research is to measure the instructional value of Achilles tendon (AT) injury-related YouTube videos. 60 videos were selected for the study after a thorough search on YouTube using relevant keywords. At-related YouTube videos have received a lot of views, but their quality and dependability are lacking. To overcome the issues, each video has assessed using the DISCERN method, which rates the accuracy of health information. Analysis of variance formula (ANOVA) was used to analyze how different video content types and sources differed in terms of dependability and content quality. Standard requirements were assessed using iterative multivariate regression models that examined the impact of specific video quality factors upon the Global Quality Score (GQS) and Achille's Tendon Specific Scores (ATSS). A total of 5 4946 364 views have been recorded for the 60 videos, with a mean view count of 1 234 463 and a range of 1 075 to 43 463 465 views per movie. The majority of films (40,8 %) and fitness instruction (18,4 %) focused on disease-specific information. The majority of films were posted by non-medical sources (32 %), followed by medical sources (34 %). Patients may get the right treatment when they need it, which lowers the chance of aggravating injuries and subsequent tendon ruptures.

**Keywords**: Achilles Tendon; Achilles Tendon Specific Score; DISCERN; Global Quality Score.

## RESUMEN

El objetivo de esta investigación es medir el valor instructivo de los vídeos de YouTube relacionados con lesiones del tendón de Aquiles (TA). Se seleccionaron 60 vídeos para el estudio tras una búsqueda exhaustiva en YouTube utilizando palabras clave relevantes. Los vídeos de YouTube relacionados con las lesiones del tendón de Aquiles han recibido muchas visitas, pero su calidad y fiabilidad son deficientes. Para superar estos problemas, cada vídeo se ha evaluado mediante el método DISCERN, que califica la exactitud de la información sobre salud. Se utilizó la fórmula del análisis de la varianza (ANOVA) para analizar las diferencias entre los distintos tipos y fuentes de contenidos de vídeo en cuanto a fiabilidad y calidad de los contenidos. Los requisitos estándar se evaluaron mediante modelos iterativos de regresión multivariante que examinaron el impacto de factores específicos de calidad de vídeo sobre la puntuación global de calidad (GQS) y las

puntuaciones específicas del tendón de Aquiles (ATSS). Se ha registrado un total de 54 946 364 visionados de los 60 vídeos, con un recuento medio de visionados de 1 234 463 y un rango de 1 075 a 43 463 465 visionados por película. La mayoría de las películas (40,8 %) y de las instrucciones de fitness (18,4 %) se centraban en información específica sobre enfermedades. La mayoría de las películas fueron publicadas por fuentes no médicas (32 %), seguidas de fuentes médicas (34 %). Los pacientes pueden recibir el tratamiento adecuado cuando lo necesitan, lo que reduce la probabilidad de agravar las lesiones y las posteriores roturas tendinosas.

**Palabras clave:** Tendón de Aquiles; Puntuación Específica del Tendón de Aquiles (ATSS); DISCERN; Puntuación Global de Calidad.

## INTRODUCTION

YouTube, a Google-owned video-sharing platform, offers a wide range of content including educational videos, movie trailers, tutorials, vlogs, and instructional material for users to subscribe and comment on. When the AT, which links the calf muscles to the heel bone, is partly or entirely ripped, it is said to have ruptured shown in figure 1. A repetitive strain injury or rapid, jarring motions may be the culprit. Many companies and organizations utilize YouTube as a marketing tool to advertise their goods and services, in addition to individual content creators.[1] 77 % of the people in the research who said they had searched for healthcare information in the last year after using a search engine. 13 % begin on medical specialty websites, 2 % begin on encyclopedia-style websites and 1 % begins on social media sites like Facebook.[2]

According to research, 71 % of people use one of the most popular websites, YouTube and more people are turning for information and ideas.[3] According to studies, the perceived quality of treatment and the patient-physician connection decreases as the usage of online resources for finding healthcare-related information rises.[4] According to studies, only 18 % of patients disclose this information to their clinicians.[5]

A self-designed technique for exercise assessment called ATEES and the well-validated informational analysis tool DISCERN were used to rate the material.[6] The goal of the research was to assess the quality, veracity, variety of treatments, correctness and reliability of Google search engine and YouTube information related to gastro esophageal reflux disease.[7]

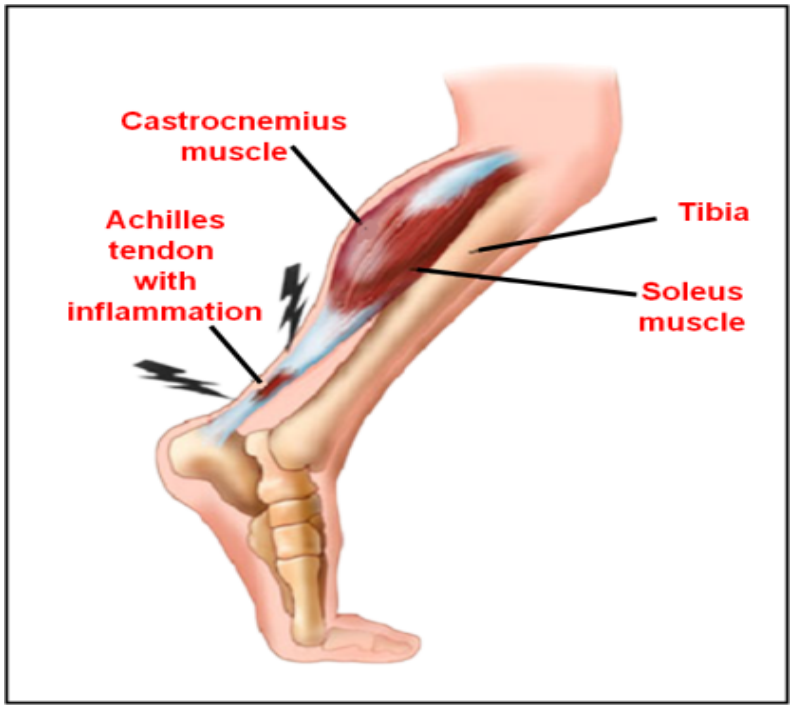


**Figure 1.** Representation of the Achilles rupture
**Source:** https://www.pinterest.com/pin/roller-foam--21884748175228901

Article[8] investigation's goal was to evaluate the information, dependability, and production value of TikTok movies on orthodontic clear aligners (OCAs). OCA-related videos on TikTok have low quality, dependability, and substance. To assess the dependability and video quality GQS and DISCERN tools were used and interclass coefficients (ICC) for interrater reliability were calculated. Research[9] calculated the accuracy and validity of

material in orthodontics-related YouTube videos. There is no pre-upload scientific assessment procedure or peer review mechanism in place; videos on YouTube have the potential to disseminate erroneous information.

To overcome these issues Reliability Score (derived from DISCERN) and GQS which rate the videos' quality, were implemented. Article[10] analyzed the caliber of the early childhood caries (ECC) information provided by YouTube for patients. A YouTube search for ECC videos was conducted. 60 % of 18 films were submitted by healthcare practitioners. In general, videos received insignificant ratings (m: 5,1 2,9; r: 1-11). Utilizing a 13-point usefulness score, the effectiveness of chosen films in giving sufficient information regarding ECC was assessed.

Study[11] aimed to assess the caliber of data made available to patients looking for lingual orthodontic treatment. The video's content was rated on a scale of 1 to 10. To separate into videos with high and low content categories. The objective of the research[12] analyzed how easily readable material on Achilles's rupture and reconstruction was available online. Study[13,14] evaluated the worth and dependability of YouTube videos regarding ruptures. The top 50 videos on YouTube that matched the search phrase Achilles tendon rupture were chosen for the study. The effectiveness of YouTube clips for meniscus tear recovery was analyzed and investigated in the research.[15,16,17] The great majority of videos were projected with low-quality. Keywords such as meniscus tear therapy, meniscus tear recuperation, meniscus tear physiotherapy, and meniscus tear treatment were chosen to avoid the issues.[18] Research[19,20] assessed the effectiveness and instructional value of YouTube videos on adhesive capsulitis. Research[21] evaluated the validity and reliability of YouTube videos on lateral epicondylitis. To tackle these deficiencies, the ranking of the clips was calculated utilizing the VPI, or video potency indexes. Research[22] intended to assess the AT-related instructional value of YouTube videos. AT-related YouTube videos have received a lot of views, but their quality and dependability are lacking.

## METHOD

The researchers that conducted this study performed a YouTube search for "AT". To ensure that no confounding variables affected the findings, an incognito tab was opened in Google Chrome. The first 60 videos were captured for assessment and queued up using the relevance filter as its default setting. This is a legitimate strategy given that comparable research on orthopedic-related subjects has been undertaken and published in peer-reviewed publications in the past.

### Video Characteristics

Study recorded key video attributes such as title, source, views, duration, likes, view ratio, content type, and VPI. YouTube videos provide educational content, including lectures, documentaries, and how-to videos, featuring experts to enhance learning accessibility.

### Video content

The following content categories were included: exercise instruction (AT treatment and rehabilitation), Patient stories, surgical methods, disease-specific knowledge and procedures and nonsurgical intervention or therapy.

### Video sources

Vimeo, TikTok, Instagram, Facebook, and Netflix are popular social media platforms for filmmaking, sharing content, and connecting with friends and clients. Vimeo allows users to post and share high-quality movies, TikTok caters to younger audiences, Instagram is popular for marketing, Facebook allows users to share media, and Netflix offers a wide selection of films and documentaries.

### Assessment of the instructional value of videos

Assessing the educational value of a YouTube video should focus on its accuracy and dependability, rather than its aesthetic appeal or engagement. Verification can be achieved through research, reviews, and expert opinions. A movie receives one point for each of the four criteria in tzable 1, with a minimum score of 0 and an average of 4. The reliability of online resources has been evaluated using the benchmark criteria, despite the fact that they have not been independently tested in prior publicly available studies. When evaluating the educational usefulness of online resources, GQS considers five factors. The quality of the instructional material increases with a greater score for each of the five categories stated in table 2, It includes an average of five points and a lowest of 0. The YouTube video's specifics are shown in table 3. The scoring system, with a minimum value of 0 and a maximum value of 19, is displayed in Figure 2. Each video receives one point for each of the 19 prerequisites. With a better grade, the concepts of disease and AT function have been more thoroughly examined.

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**Table 1.** Benchmark criteria

| Criteria | Description |
|---|---|
| Currency | Both the original publication date and any later revisions to the material should be stated. |
| Authorship | It is necessary to give the qualifications and affiliations of the authors and contributors. |
| Attribution | Provides all copyright details clearly and specifies all content references and sources. |

**Table 2.** GQS Standards

| Grading | Quality evaluation |
|---|---|
| 1 | Excellent flow and quality: very beneficial to patients. |
| 2 | Poor quality: fails to be beneficial for patient education. |
| 3 | Good content and organization: patients will find this information helpful since it covers the most significant aspects of their care. |
| 4 | Low quality: minimal value for patients due to the scarcity of information |
| 5 | Inadequate quality and flow: Patients could find this material to be somewhat helpful. However, it is lacking some crucial facts. |

**Table 3.** Characteristics of the YouTube Video

| Video characteristic | Min | Max | Standard Deviation | Mean | Median |
|---|---|---|---|---|---|
| Like ratio | 778 | 99 | 5,46 | 9798 | 97,8 |
| Likes | 11 | 682000 | 97520 | 17446 | 510 |
| Dislikes | 0 | 28000 | 3902 | 622 | 15,6 |
| Days since upload | 138 | 4020 | 1346 | 1564 | 1564 |
| Views | 1075 | 43463465 | 6083460 | 1 234 463 | 57746 |
| View ratio | 1,23 | 343526 | 49249 | 8546 | 60 |
| Comments | 0 | 4245 | 642 | 236 | 3 785 |
| Video power index (VPI) | 1,06 | 389435 | 46317 | 6892 | 57,9 |
| Video duration (minutes) | 0,99 | 2798 | 5,72 | 5,37 | 5,09 |

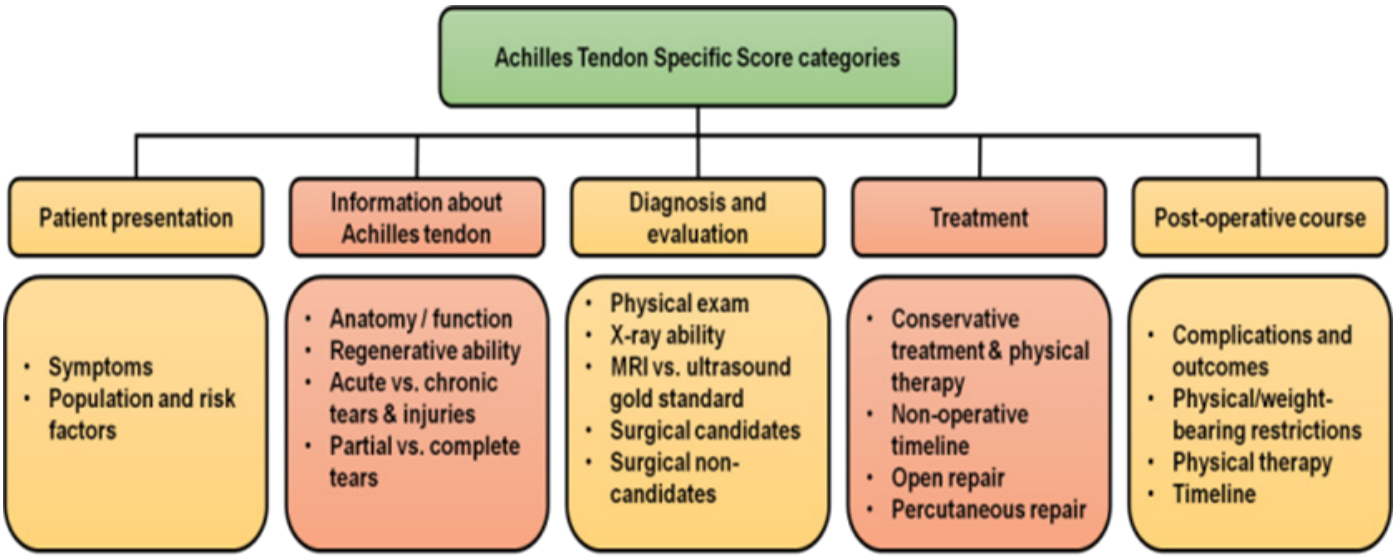


**Figure 2.** Category of ATSS

## RESULT

The SPSS version 27,1 was used for the analysis. The features, dependability, and quality grades (GQS benchmark criteria and ATSS) for every film were quantified using descriptive statistics, such as percentages standard deviation (SD), min, max, averages, and frequencies. Four writers independently evaluated each video using the ATSS, GQS benchmark criteria. Since each author entered their judgments on a different spreadsheet, no writers were awake of the grade provided by other researchers. The study used SPSS to analyze 60 videos

for compliance with GQS and ATSS grades, determining their interrater reliability using Z tests, and examining dependability and quality using ANOVA Kruskal-Wallis tests for data normality.

To assess the impact of certain video qualities, content Types, or video sources on the benchmark criterion grade (reliability), GQS and ATTS, multivariate linear stepwise regression was used. Statistics were deemed significant for P-values under 0,05. With a cumulative total of 54 946 364 views over 60 videos queued in thisresearch they received a staggering number of views, with a mean of 1 234 463, and a range of 1 075 to 43 463 465 per video. The study found that YouTube videos on orthopedic subjects, including PCL, disc herniations, and hypnosis, had poor dependability, accuracy, and instructional value. The average dependability and correctness of each YouTube video between moderate to poor, according to the benchmark criterion, which has a mean grade of 2,63 out of 4,0. The additional video features are shown in table 4.

**Table 4.** GQS, ATSS, and mean benchmark criterion ratings for various video content sources

| Variable Term | mean and SD of ATSS | mean and SD of GQS |
|---|---|---|
| Video content | | |
| Advertisement | 5,9 (3,9) | 2,9 (0,8) |
| Non-surgical | 5,4 (2,4) | 2,9 (0,8) |
| Patient experience | 5,7 (0,2) | 2,9 (0,4) |
| Surgical treatment | 5,1 (3,6) | 2,8 (1,3) |
| Exercise training | 5,2 (1,7) | 2,7 (0,4) |
| Disease-specific | 5,5 (3,3) | 2,9 (1,0) |
| Original Video | | |
| Academic | 3,3 (0,9) | 2,3 (0,6) |
| Athletic trainers | 2,6† | 2,6† |
| Non-physician | 4,5 (2,3) | 2,9 (0,6) |
| Medical sources | 5,4 (3,4) | 2,8 (1,1) |
| Commercials | 3,9 (3,3) | 2,4 (1,1) |
| Physician | 6,3 (3,6) | 2,8 (1,2) |

The fact that YouTube videos score an average GQS of 2,9 out of 5,0 shows that the educational value of their material is low and each video's capacity to teach viewers varies from mediocre to bad. Nursing students were given a small portion of the knowledge they would need to understand the body and its illnesses, as evidenced by the average ATSS score of 5,46 out of 19, which indicates that the information was incomplete. With an average GQS score of 2,5 out of 5, these statistics indicate a lower level of quality.

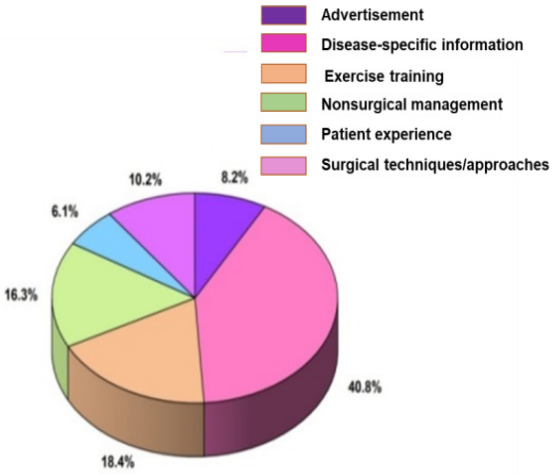


**Figure 3.** YouTube videos connected to Achilles' relative frequency of video content

The educational content of the videos must adhere to the trustworthy, peer-reviewed criteria set by the AAOS, which were included in the ATSS of this research, that to be right and maximize the value to the patient. It has been said, individual YouTube videos may have low-quality and insufficient content, but they might be used as a starting point for patients to learn more about their conditions. As indicated in figure 3, films

were used to convey disease-specific information (40,8 %), exercise advice (18,4 %), surgical techniques (10,2 %), and nonsurgical treatment (16,3 %) approaches. The most common sources of the films in figure 4 were non-physicians (32 %), such as podiatrists, chiropractors, physiotherapists, and physical therapists, as well as medical sources (34 %), such as health teams.

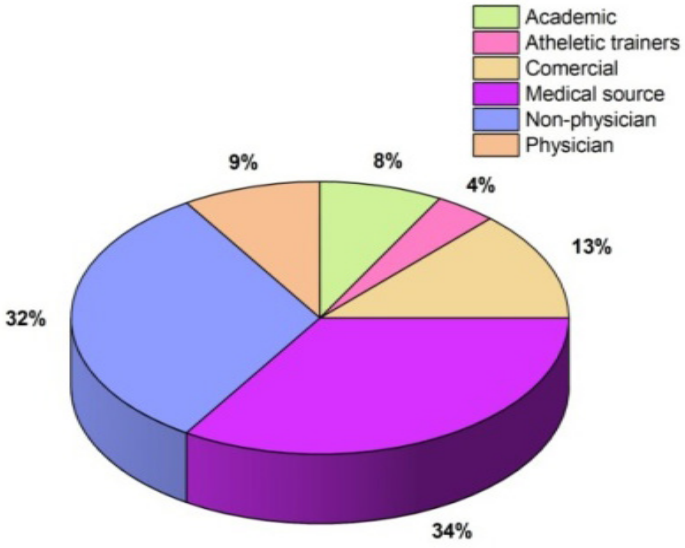


**Figure 4.** YouTube videos relating to Achilles' relative frequencies

**Limitation**

The first 60 YouTube videos that were searched for using the phrase AT were the focus of this research and analysis. Although this restricts the generalizability of the research, it may reflect the real search habits of many users, who seldom go beyond the first page or two of results when looking up a subject.

The study used invalidated techniques to assess internet resource validity and quality, revealing strong inter-observer reliability for GQS and ATSS grades. However, the reliability assessment was inconsistent, indicating a weak evaluation of instructional content.

## CONCLUSION

No exclusion criteria were fulfilled by any of the first 60 YouTube videos that the search returned. The additional video features and these films have a total cumulative view count of almost 55 million. The internet is becoming more powerful tool for obtaining a variety of types of information. To better communicate with their patients, healthcare providers should ask them whether they have used online resources to learn about their problems or by assisting them in making better use of these resources. Even if the material offered their poor quality and lacking in substance, Millions of users and an ever-growing user base make YouTube a sizable and popular free platform with easily available and used videos. The AAOS website offers superior sources. However, they are much less popular and utilized as often. In contrast to videos, which are active through a topic, major provide data in the form of images and text, which is frequently less engaging and more daunting. The usage of the information server will improve over the next several years. Patients may feel more in charge of their treatment if the doctors could effectively discuss these sources with them, take part in these designs, and educate patients on their usage. Patients can discover reasons to better communicate their expertise with their physician rather than just receiving education from them.

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## FINANCING

None.

## CONFLICT OF INTEREST

None.

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