

## Is Youtube an Adequate and Reliable Source for Calcaneal Spur?

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### ABSTRACT

YouTube contains videos that provide information about many health conditions. Patients and healthcare professionals frequently use YouTube to obtain information. The calcaneal spur (heel spur) is a bony outgrowth of the calcaneal tuberosity in the form of osteophytes. In this study, we aimed to determine the quality and reliability of YouTube videos about the calcaneal spur, whose prevalence increases with age and is more common in those with osteoarthritis.

Search was made with the keywords 'Calcaneal spur' and 'heel spur'. Of the 300 videos reviewed, 104 were included in the study. The number of days since the videos were uploaded, the number of views, likes, dislikes, comments and the duration of the videos were recorded. The DISCERN tool and the Global Quality Scale (GQS) were used to evaluate the reliability and quality of the videos.

Most of the video presenters were healthcare professionals (79.80%). In 65.4%, the target audience was patients. 61.4% of the videos were low quality, 32.69% medium quality, 5.77% high quality. There was no difference between health professionals and non-health professionals in terms of quality and reliability.

This study showed that most of the information provided by YouTube videos about the calcaneal spur is not reliable and inconsistent. YouTube should consider collaborating with database platforms, which is constantly updated and equipped with evidence-based information, to provide reliable health information on many health issues, including the calcaneal spur.

**Keywords:** Calcaneal spur, Heel spur, YouTube, Quality, Reliability

### INTRODUCTION

The calcaneal spur (heel spur) is a bony outgrowth of the calcaneal tuberosity in the form of osteophytes. The prevalence of calcaneal spurs in the young and middle-aged is 11-21%. This rate increases with age. It increases to 55% over the age of 62, to 59-78% in those with current or pre-existing heel pain, and up to 81% in those with osteoarthritis (Kirkpatrick et al., 2017). Studies predict that calcaneal spur will become an increasing problem in the future with the aging population (Beytemür et al., 2018).

The calcaneal spur mostly occurs in association with plantar fasciitis (Kirkpatrick et al., 2017). Usually, there is pain in the calcaneal region on the first press in the morning or after a long rest and when standing for a long time. It causes difficulties in walking and other physical activities due to pain and quality of life is impaired. Obesity, wearing unsuitable shoes or high heels, hereditary factors, long standing, aging, endocrine and rheumatological diseases are the most important etiologic causes ((Kirkpatrick et al., 2017; Moroney et al., 2014).

In treatment; rest, cold pack application, foot and ankle stretching exercises, NSAIDs, steroid injection, ESWT, electrotherapy, radiotherapy, using soft insoles, wearing shoes with appropriate soles, massage and weight loss (Rosenbaum et al., 2014; Kociuga et al., 2016; Agyekum et al., 2015; Prokein et al., 2017). In cases where treatments fail, plantar fasciotomy or endoscopic heel spur surgery may be required (Johannsen et al., 2020).

Communication technology has been used for decades to increase access to health care and improve medical care (Grigsby et al., 1995; Bashshur et al., 1976; Charles, 2000). In this context, the interest in Telemedicine service, which has been applied for a long time, is increasing. The main reason for the development of telemedicine services is to provide healthcare services to people whose access to healthcare services is restricted

for any reason (Weisgrau, 1995). Especially in the period of Covid-19 restrictions, its importance has increased even more. The fact that it provides accessible information at all hours of the day ensures that the internet is used intensively not only for accessing health services, but also as a source of information in the field of health. YouTube is the most commonly used website for this purpose. It is known that 80% of Internet users access health information online (Madathil et al., 2015), making YouTube the second most popular website worldwide after Google Search (Wikipedia, 2020). YouTube contains videos that provide information on the pathogenesis, diagnosis, treatment and prevention of various diseases. Although patients frequently use YouTube to obtain information about their disease, 86% of searchers are concerned about the reliability of the information, and 44% state that they can only believe some of the information found on the internet (Koller et al., 2016). Similar to studies in other health-related fields, in the evaluation studies of YouTube videos on the musculoskeletal system, the majority of the videos were found to be of poor or very poor quality (Sari et al., 2021; Basch et al., 2018; MacLeod et al., 2015; Jildeh et al., 2021; Tejada-Llacsca et al., 2020; Onder et al., 2022). In this study, it was aimed to determine the quality and reliability of YouTube videos about calcaneal spur, which is a common musculoskeletal problem and impairs people's quality of life.

## MATERIALS AND METHOD

### Study design and ethics

On January 22, 2022, a search was made on <https://www.youtube.com/> with the keywords “calcaneal spur/ heel spur”. The call history was deleted before the call. Since the frequency of repetitions increased after the 300th video, the first 300 videos were evaluated. Videos containing only product advertisements, duplicate videos, videos in languages other than English, patient experience videos, surgery-related videos, video-only or audio-only videos, and irrelevant videos were excluded from the study. Of the 300 videos reviewed, 104 met the inclusion criteria. All selected videos have been added to the YouTube library database for detailed analysis.

### Video features, quality, reliability, and usability analysis

Views, view rate (views/g), total video duration, total comments, total "likes" and "dislikes", comments/days, time since upload date, and upload source were recorded.

**Download resources;** They were categorized as physician, non-physician healthcare professional (physiotherapist, podiatrist, acupuncturist, mesotherapist, yoga instructor, personal trainer), academic institutions, health-related websites, company websites, and independent users.

Video power index was not calculated because there was no dislike for any of the videos. The popularity of the videos was determined by the rate of likes (the number of views during the broadcast period / the time since the upload date).

**Variables;** The duration after the video was published (days), video duration (seconds), views, daily views, likes, dislikes, and comments were determined.

**Video content;** were classified as cause/pathophysiology, diagnosis, treatment, recommendation and balanced content. Since a video can have multiple themes, the duration of each theme in the video was taken into account; if a theme is more than 50% of the entire video duration, the content was defined through a single theme; however, if no theme reached this percentage, it was defined as "balanced content". The videos that did not reach an agreement on the video content among the reviewers were re-examined. Video contents were evaluated by two independent physiatrists. Consensus was reached among raters for items that differed.

**Target group;** They were identified as patients, healthcare professionals, and unclear. DISCERN and the Global Quality Scale (GQS) were used to determine the reliability and quality of the videos.

In DISCERN, each question is scored on a 5-point (1-5) scale. It is scored as 5 if it fully meets the criterion, and as 1 if it does not. If it meets the criteria to some extent, a score between 2-4 is given according to the judgment of the evaluators. The DISCERN guide includes detailed information for each question, including instructions and examples. The total DISCERN score is calculated by adding the first 15 questions. It is classified as excellent (63-75), good (51-62), moderate (39-50), poor (27-38) and very poor (<27).

This is a descriptive study performed by searching through a website. This study does not require ethical committee approval since it was conducted by examining videos that are free for common use on the internet. No human participants or animals were included in this study.

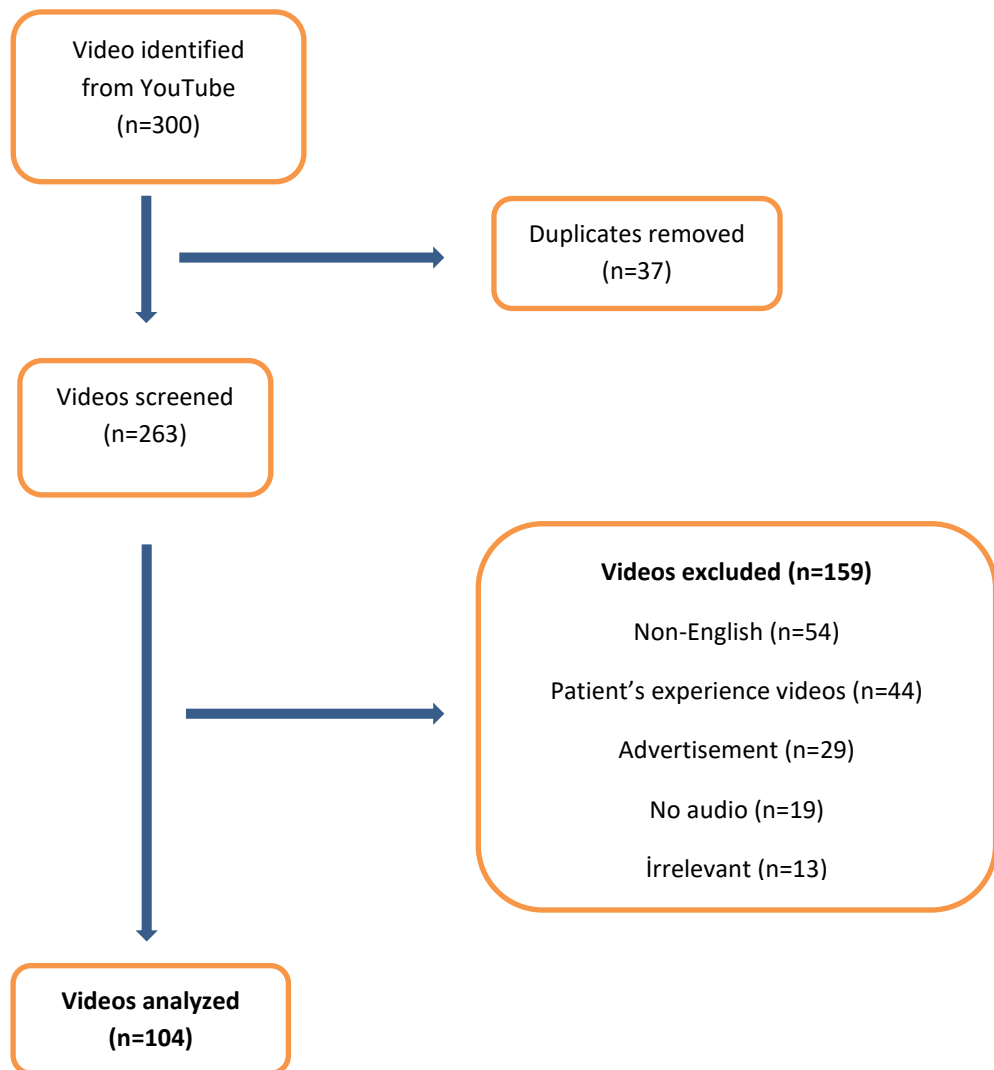
**Statistical analysis**

Statistical tests were performed using SPSS v. 23.0 for Windows (IBM SPSS Statistics for Windows; Armonk, NY: IBM Corp). The Shapiro–Wilk test was applied to evaluate the normality of data. The inter-observer agreement was specified with Cohen’s kappa coefficient. Non-normally distributed continuous variables were expressed as median (minimum–maximum) values and categorical variables were showed as number or percentages. The Mann–Whitney *U* test were used to compare two independent groups and the Kruskal–Wallis test were used to compare more than two groups. Significant difference in the Kruskal–Wallis test were evaluated using the Mann–Whitney *U* test with Bonferroni correction that automatically adjusted. A *p* value of less than 0.05 was considered as statistically significant.

**RESULTS**

A total of 300 videos were scanned for the research. 54 videos in languages other than English, 119 videos that contain only images, 37 videos that are repeated, 44 videos with patient experience, 29 videos with advertising content, 13 videos that are not related to the subject were excluded from the study. A total of 104 videos were included in the study for detailed analysis (Fig 1).

Fig.1 Flowchart of YouTube video screening process



The kappa statistics for inter observer agreement were 0.746 for GQS, 0.708 for DISCERN. The median value of the online duration of the videos was 1478.50 days, the number of dislikes was "0", and the median value of GQS AND DISCERN quality was 2. The basic features of the videos are shown in Table 1.

**TABLO 1. Baseline features of the analyzed videos**

variables	Videos (n=104) median (min-max)
days online	1478.50 (95-6158)
Duration (sec)	212.50 (29-1131)
Number of views	13417.00 (6- 2721863)
Number of likes	48,50 (0- 16000)
Number of comments	8,00 (0-1021)
View ratio	7.42 (0.01- 1070.36)
GQS	2 (1-4)
DISCERN reliability	18 (8-24)
DISCERN treatment	9 (7-23)
DISCERN quality	2 (1-4)
DISCERN total	28 (15-46)

GQS, Global Quality Score

Video content includes pathophysiology (n:22, 21.2%), diagnosis (n:3, 2.9%), treatment (n:65, 62.5%), recommendation (n:2, 1.9%), and balanced (n:12,%) 11.5).

Video servers distribution; physician 29.8%, non-physician healthcare provider 29.8%, academic institutions 1.0%, independent health-related websites 20.2%, company website 14.4%, independent users 4.8%.

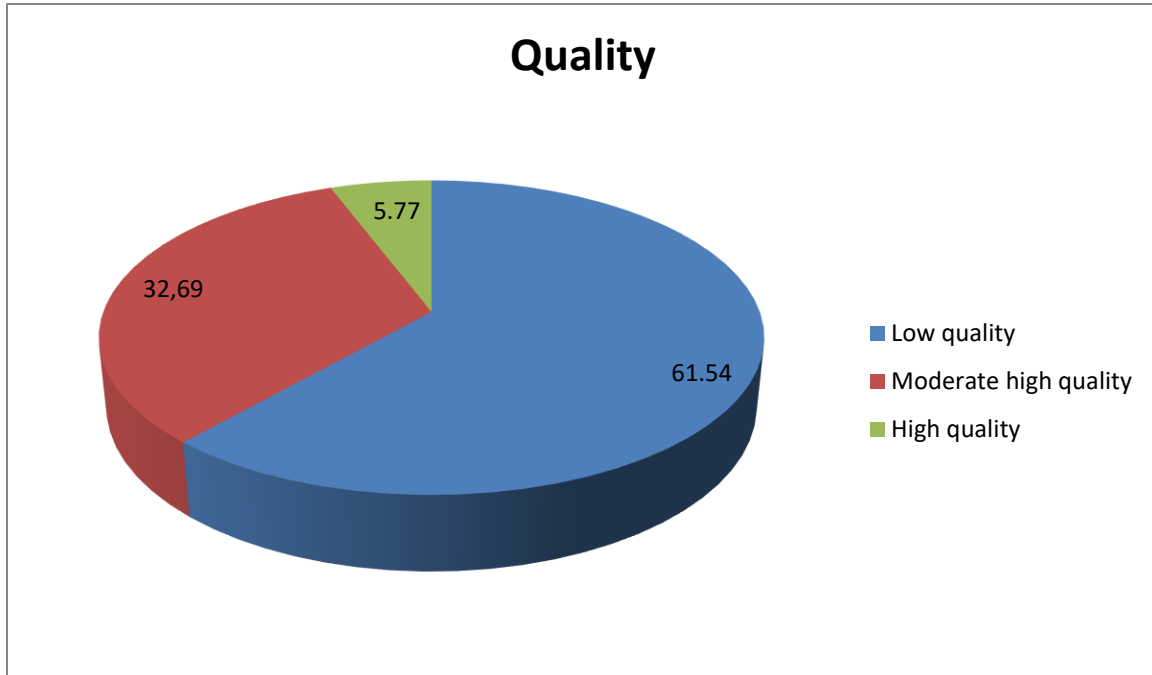
65.4% (n:68) of the videos were for patients and 22.1% (n:23) were for healthcare professionals. The target group of 12.5% (n:13) was unclear.

The number of high-quality videos in doctors and non-physician healthcare providers was quite low. None of the videos from other sources were of high quality. The quality evaluation of the videos according to the sources is shown in Table 2.

**TABLO 2. Categorization of the videos according to sources**

Source	Low quality n	Moderate quality n	High quality n	Total n(%)
Physician	16	12	3	31(29,8)
Non- physician healthcare professionals	20	8	3	31(29,8)
Academic institutions	1	0	0	1(1)
Health related websites	10	11	0	21(20,2)
Society/ non-profit organization	14	1	0	15(14,4)
Independent users	3	2	0	5(4,8)

The quality of all videos is evaluated; It was determined that 65 videos were of low quality, 34 of them were of medium quality, and 6 of them were of high quality (Fig 2).



A significant moderate correlation was found between the GQS score and the video duration ( $p < 0.001$   $r = 0.438$ ), and a significant but weak correlation between the GQS score and the number of likes and comments ( $p = 0.021$   $r = 0.225$ ;  $p = 0.007$   $r = 0.263$ ), respectively.

Significant moderate correlation between Discern total score and video duration ( $p < 0.001$   $r = 0.400$ ), a significant but weak correlation between Discern total score and number of likes and comments ( $p = 0.036$   $r = 0.206$ ;  $p = 0.011$   $r = 0.249$ ) It was determined that there was a significant and strong correlation between Discern total and GQS ( $p < 0.001$   $r = 0.866$ ). Comparison of video parameters with quality scores is shown in Table 3.

TABLE 3. Comparison of the video parameters between the quality groups.

	Low quality (n=64)	Moderate quality (n=34)	High quality (n=6)	p*
days online	2280,50 (95-6158)	1574 (202-4649)	609 (435- 1406)	0,502
Duration (sec)	207 (39- 750)	279 (127-1131)	540 (280- 940)	<b>&lt;0,001**</b>
Number of views	<b>34843 (602-</b>	<b>79916 (161-</b>	49911 (7294- 170895)	0,127
Number of likes	78 (2-4200)	607,50 (14-16000)	871 (189- 4000)	0,054
Number of comments	13,50 (0- 177)	68 (0-1021)	60 (11- 157)	0,227
View ratio	13,24 (0,29-563,27)	69,18 (0,79-804,30)	81,96 (5,19-392,86)	0,416
DISCERN reliability	15 (8-20)	21 (14-24)	22 (21-23)	<b>&lt;0,001**</b>
DISCERN treatment	8 (7-12)	15 (7-23)	20 (19-20)	<b>&lt;0,001***</b>
DISCERN quality	2 (1-4)	3 (1-4)	2 (2-3)	0,405
DISCERN total	23 (15-30)	33,50 (25-46)	40 (40-43)	<b>&lt;0,001**</b>

Values are median (minimum-maximum).

\*Significance level for the comparison between the groups based on quality (Kruskal–Wallis)

\*\*post-hoc bonferonni test Adjusted p-value for pairwise comparison of the low quality and modarate quality, low quality and high quality groups ( $p < 0,05$ )

\*\*\* post hoc bonferonni test, Adjusted p-value for pairwise comparison of low quality and modarate quality, low quality and high quality groups, modarate quality and high quality groups ( $p < 0,05$ )

There was no difference between health professionals (n=63) and non-health professionals (n=41) in terms of quality and reliability. Comparison of reliability and quality scores with video source groups is shown in Table 4.

TABLE 4. Comparison of the reliability and quality scores to video source groups.

	Health professionals* median (min-max)	Non-health professionals* median (min-max)	P value**
GQS	2 (1-4)	2(1-3)	0,197
DISCERN reliability	20 (8-24)	17 (8-24)	0,074

DISCERN treatment	9 (7-20)	9,5 (7-23)	0,662
DISCERN quality	2 (1-4)	2 (1-4)	0,916
DISCERN total	28,5 (15-43)	27,5 (15-46)	0,304

\*type of video source

\*\*Mann-Whitney U Test

## DISCUSSION

Calcaneal spur is one of the musculoskeletal system problems that increase in prevalence with the aging population and negatively affect the daily life quality of individuals (Irving et al., 2008).

This study is the first to evaluate the content of English calcaneal spur videos on YouTube. In this study, we analyzed 104 videos with a viewing rate of 7.42/day. Most of the videos (65.4%) targeted patients. The majority of the videos focused on treatment (62.5%) and pathophysiology (21.2%).

Although the videos included the pathophysiology, diagnosis, treatment and recommendations of the calcaneal spur, it was seen that the quality of the information presented in most of the videos was not sufficient. It has been determined that the videos with longer duration are of better quality. As expected, when the time is increased, the subject can be explained more clearly and in more detail. Similar to the findings in our study, some researchers have found that high-quality videos have a longer duration than those of poor quality (Gaş et al., 2019; Crutchfield et al., 2021). However, there is a risk that patients may lose their interest and attention while watching a longer video (Lena et al., 2018). Therefore, video sources should provide high-quality information on the topic within a reasonable time.

In our study, approximately 60% of the videos were presented by health professionals. We could not find a significant difference in videometric parameters (number of views, number of likes, number of comments, view ratio) between healthcare professionals and non-health professionals. Other studies reporting that there is no significant difference in videometrics (views, daily views, likes and dislikes) between the videos presented by both groups on YouTube support our findings (Onder et al., 2022; Irving et al., 2008; Gaş et al., 2019; Crutchfield et al., 2021; Lena et al., 2018; Elangovan et al., 2021; Kocyigit et al., 2020).

In our research, the videos presented by health professionals were of higher quality and reliability. Despite this, the quality of the videos provided by the healthcare professionals was not satisfactory. Similar to our study, Dincel et al. (Dincel et al., 2021), when they examined the videos about Achilles tendon rupture, determined that although the quality scores of the videos uploaded by the doctors were higher than the other groups, even these videos did not contain sufficient quality information Dincel (Dincel et al., 2021). In the study of Onder et al. (Onder et al., 2022), in terms of reliability and quality, videos presented by healthcare professionals had higher GQS and DISCERN scores compared to non-health professionals.

In our study, the rate of high quality videos was very low (5.76%). The longer the video duration, the higher the quality was significantly. The determinants of the improvement in quality were the significant increase in Discern reliability and treatment section. In the YouTube study on osteoporosis, the number of high-quality videos was predominantly high, unlike our data ((Onder et al., 2022). The hosts of 60.9% of these videos were healthcare professionals. Kocyigit et al. They found a higher rate of high-quality video in the videos they analyzed. They did not find a significant difference between the groups in terms of daily views, likes, dislikes and comments (Kocyigit et al., 2019). In another study, all videos created by academic institutions/professional organizations were found useful. There was no significant difference between helpful and misleading videos in terms of average number of likes and comments and video length. Average views and daily views were significantly higher for misleading videos than helpful videos (Onder et al., 2021). Similarly, a study on CTS found that 78% of videos contained at least one statement that could reinforce common misconceptions about CTS (Goyal et al., 2021). Desai et al. found that although instructional videos had accurate and reliable information, they were viewed less frequently than low-quality videos (Desai et al., 2013).

Videos with low quality scores run the risk of reinforcing false information. Considering that the vast majority of videos about the calcaneal spur (62.5%) focus on treatment and most of the content is unreliable, it will be seen how high the health risks are. A study by Rice (Rice 2006) showed that 25% of people seeking health information always check the video source, 25% check occasionally and 50% never check. Studies have shown that the attractiveness or intelligibility of videos is just as effective on view rates as the content itself (O'Neill et al., 2014). In order to educate and inform patients, it is necessary to improve the information sources and increase their attractiveness and understandability. The tendency of patients to search for information online and the lack of reliability of online information may lead to misdirection of patients and deterioration of the

clinician-patient relationship. Accurate and reliable information will enable the patient to take an active role in decision-making processes and reduce anxiety levels (Longtin et al., 2010; Ketelaars et al., 2017).

Increasing the reliability of information sources will play an active role in patients' decision-making about their own health and ultimately reduce the cost. For this purpose, studies should be carried out to prepare quality videos with internationally accepted guidelines (Karagoz et al., 2022). Healthcare providers and professional communities should also provide more educational material using this powerful Internet tool to avoid misleading information (Mukewar et al., 2013).

As part of its 2021 policies, YouTube has decided to take down videos containing COVID-19 and vaccination information that contradicts the consensus of health authorities (Letter from Susan, YouTube Official, 2021). He stated that their aim was to remove content that experts determined to be harmful, to increase reliable content, and to reduce viewing of low-quality content (Letter from Susan, YouTube Official, 2021). It also partnered with professional organizations such as the Cleveland Clinic and Mayo Clinic to make health-related information more accessible and understandable in early 2021, and announced that they would like to establish more partnerships with different reputable healthcare organizations (YouTube, 2021). YouTube's presentation of videos created with verified sources on the first page of search results and filtering those uploaded by independent users in cooperation with experts can also contribute positively to accessing accurate information. In addition, universities and professional organizations should increase the number of videos they produce.

One of the strengths of our research is that it is the first study on YouTube to analyze videos about the calcaneal spur. The other; as a result of determining that the content related to the subject is not sufficient and reliable, it contributes to the literature by creating awareness about the improvement of the content.

This study has several limitations. Only English videos were analyzed and searched with only 2 keywords. YouTube is a dynamic platform and search results change as new videos are added over time. As it is a cross-sectional study, the findings of this study are only the results of the analysis of the videos in a certain time period. Therefore, the data obtained in this study may differ from the data obtained by another researcher searching for the same terms. Geographical location and searching in different languages also affect the results. In our research, our evaluation methods did not analyze how long users watched a particular video and the extent to which the viewer understood it. The opinions of the users on this subject were obtained by interpreting the metrics such as viewing, liking and disliking.

## CONCLUSION

In our research, we determined that the quality and reliability of the information provided by most of the YouTube videos about the calcaneal spur is not sufficient. The data obtained showed that the available YouTube videos cannot guide patients to understand the causes that may facilitate the occurrence of calcaneal spur, the treatment options, and the possible risks they may face in the absence of treatment.

YouTube should consider collaborating with database platforms such as UpToDate, which is constantly updated, equipped with evidence-based information, and easy to use, to provide reliable health information on many health issues, including the calcaneal spur.

Providing health professionals with proven and sourced videos will enable YouTube users to access accurate, reliable and satisfactory information.

## Ethics approval

Ethical approval was not required as public YouTube videos were reviewed and no human/animal participants were included in the study.

The authors declare that there is no conflict of interest.

Conception or design of the work: ZK, SB. Data collection: ZK, SB. Data analysis and interpretation: ZK, SB. Drafting the article: ZK.

## REFERENCES

- Agyekum EK, Ma K. (2015) Heel pain: A systematic review. *Chin J Traumatol.* 2015;18(3):164-9. doi: 10.1016/j.cjtee.2015.03.002. PMID: 26643244.
- Basch CH, Yin J, Walker ND, et al. (2018) TMJ online: Investigating temporomandibular disorders as "TMJ" on YouTube. *J Oral Rehabil.* Jan;45(1):34-40. doi: 10.1111/joor.12580. Epub 2017 Oct 24. PMID: 28965355.

- Bashshur RL, Armstrong PA. (1976) Telemedicine: A New Mode for the Delivery of Health Care. *Inquiry*. 1976;13:233–244. [PubMed] [Google Scholar]
- Beytemür O, Öncü M. (2018) The age dependent change in the incidence of calcaneal spur. *Acta Orthop Traumatol Turc*. 2018;52(5):367-371. doi:10.1016/j.aott.2018.06.01
- Charles BL. (2000) Telemedicine can lower costs and improve access. *Healthc Financ Manage*. Apr;54(4):66-9. PMID: 10915354.
- Crutchfield CR, Frank JS, Anderson MJ, et al. (2021) A Systematic Assessment of YouTube Content on Femoroacetabular Impingement: An Updated Review. *Orthop J Sports Med*. Jun 29;9(6):23259671211016340. doi: 10.1177/23259671211016340. PMID: 34262981; PMCID: PMC8246525.
- Desai T, Shariff A, Dhingra V, et al. (2013) Is content really king? An objective analysis of the public's response to medical videos on YouTube. *PLoS One*. Dec 18;8(12):e82469. doi: 10.1371/journal.pone.0082469. PMID: 24367517; PMCID: PMC3867348.
- Dincel YM, Can E, Kanlikama M, et al. (2021) Assessment of the quality and reliability of achilles tendon rupture videos on YouTube. *Int J Orthop Sci*. 7:612-5. 10.22271/ortho.2021.v7.i2h.2684
- Elangovan S, Kwan YH, Fong W. (2021) The usefulness and validity of English-language videos on YouTube as an educational resource for spondyloarthritis. *Clin Rheumatol*. Apr;40(4):1567-1573. doi: 10.1007/s10067-020-05377-w. Epub 2020 Sep 2. PMID: 32880051.
- Gaş S, Zincir ÖÖ, Bozkurt AP. (2019) Are YouTube videos useful for patients interested in botulinum toxin for bruxism? *J Oral Maxillofac Surg*. 77(9):1776-1783.
- Goyal R, Mercado AE, Ring D, et al. (2021) Most YouTube Videos About Carpal Tunnel Syndrome Have the Potential to Reinforce Misconceptions. *Clin Orthop Relat Res*. Oct 1;479(10):2296-2302. doi: 10.1097/CORR.0000000000001773. PMID: 33847604; PMCID: PMC8445577.
- Grigsby J, Kaehny MM, Sandberg EJ, et al. (1995) Effects and effectiveness of telemedicine. *Health Care Financ Rev*. Fall;17(1):115-31. PMID: 10153466; PMCID: PMC4193577.
- Irving DB, Cook JL, Young MA, et al. (2008) Impact of chronic plantar heel pain on health-related quality of life. *J Am Podiatr Med Assoc*. Jul-Aug;98(4):283-9. doi: 10.7547/0980283. PMID: 18685048.
- Jildeh TR, Abbas MJ, Abbas L, et al. (2021) YouTube Is a Poor-Quality Source for Patient Information on Rehabilitation and Return to Sports After Hip Arthroscopy. *Arthrosc Sports Med Rehabil*. May 14;3(4):e1055-e1063. doi: 10.1016/j.asmr.2021.03.011. PMID: 34430885; PMCID: PMC8365195.
- Johannsen F, Konradsen L, Herzog R, et al. (2020) Endoscopic fasciotomy for plantar fasciitis provides superior results when compared to a controlled non-operative treatment protocol: a randomized controlled trial. *Knee Surg Sports Traumatol Arthrosc*. Oct;28(10):3301-3308. doi: 10.1007/s00167-020-05855-3. Epub 2020 Jan 31. PMID: 32006073.
- Karagoz B, Bakir M, Kececi T. (2022) Evaluation of the Accuracy and Quality of Information in Videos About Lateral Epicondylitis Shared on Internet Video Sharing Services. *Cureus*. Feb 24;14(2):e22583. doi: 10.7759/cureus.22583. PMID: 35371738; PMCID: PMC8958132.
- Ketelaars PJW, Buskes MHM, Bosgraaf RP, et al. (2017) The effect of video information on anxiety levels in women attending colposcopy: a randomized controlled trial. *Acta Oncol*. 56(12):1728-1733. <https://doi.org/10.1080/0284186x.2017.1355108>
- Kirkpatrick J, Yassaie O, Mirjalili SA. (2017) The plantar calcaneal spur: a review of anatomy, histology, etiology and key associations. *J Anat*. Jun;230(6):743-751. doi: 10.1111/joa.12607. Epub 2017 Mar 29. PMID: 28369929; PMCID: PMC5442149.
- Kociuga N, Kociuga J, Woldańska-Okońska M, et al. (2016) [Physiotherapeutic proceeding in symptomatic calcaneal spur treatment]. *Wiad Lek*. 2016;69(6):758-764. Polish. PMID: 28214811.
- Kocyigit BF, Akaltun MS, Sahin AR. (2020) YouTube as a source of information on COVID-19 and rheumatic disease link. *Clin Rheumatol*. Jul;39(7):2049-2054. doi: 10.1007/s10067-020-05176-3. Epub 2020 May 23. PMID: 32447603; PMCID: PMC7245189.
- Kocyigit BF, Akaltun MS. (2019) Does YouTube provide high quality information? Assessment of secukinumab videos. *Rheumatol Int*. Jul;39(7):1263-1268. doi: 10.1007/s00296-019-04322-8. Epub 2019 May 8. PMID: 31069444.
- Koller U, Waldstein W, Schatz KD, et al. (2016) YouTube provides irrelevant information for the diagnosis and treatment of hip arthritis. *Int Orthop*. Oct;40(10):1995-2002. doi: 10.1007/s00264-016-3174-7. Epub 2016 Mar 31. PMID: 27029480.
- Lena Y, Dindaroğlu F. (2018) Lingual orthodontic treatment: A YouTube™ video analysis. *Angle Orthod*. Mar;88(2):208-214. doi: 10.2319/090717-602.1. Epub 2017 Dec 19. PMID: 29257704; PMCID: PMC8312536.
- Letter from Susan: our 2021 priorities (2021) YouTube Official Blog. <https://blog.youtube/inside-youtube/letter-from-susan-our-2021-priorities/>. Accessed 13 May 2021



- Longtin Y, Sax H, Leape LL, et al. (2010) Patient participation: current knowledge and applicability to patient safety. *Mayo Clin Proc.* 85(1):53-62.
- MacLeod MG, Hoppe DJ, Simunovic N, et al. (2015) YouTube as an information source for femoroacetabular impingement: a systematic review of video content. *Arthroscopy.* Jan;31(1):136-42. doi: 10.1016/j.arthro.2014.06.009. Epub 2014 Aug 20. PMID: 25150406.
- Madathil KC, Rivera-Rodriguez AJ, Greenstein JS, et al. (2015) Healthcare information on YouTube: A systematic review. *Health Informatics J.* Sep;21(3):173-94. doi: 10.1177/1460458213512220. Epub 2014 Mar 25. PMID: 24670899.
- Moroney PJ, O'Neill BJ, Khan-Bhambro K, et al. The conundrum of calcaneal spurs: do they matter? *Foot Ankle Spec.* 2014 Apr;7(2):95-101. doi: 10.1177/1938640013516792. Epub 2013 Dec 30. PMID: 24379452.
- Mukewar S, Mani P, Wu X, et al. (2013) YouTube and inflammatory bowel disease. *J Crohns Colitis.* Jun;7(5):392-402. doi: 10.1016/j.crohns.2012.07.011. Epub 2012 Aug 18. PMID: 22906403.
- New health content is coming to YouTube (2021) YouTube Official Blog. <https://blog.youtube/news-and-events/new-health-content-coming-youtube/>. Accessed 13 May 2021
- Onder ME, Onder CE, Zengin O. (2022) Quality of English-language videos available on YouTube as a source of information on osteoporosis. *Arch Osteoporos.* Jan 20;17(1):19. doi: 10.1007/s11657-022-01064-2. PMID: 35059873; PMCID: PMC8776324.
- Onder ME, Zengin O. (2021) YouTube as a source of information on gout: a quality analysis. *Rheumatol Int.* Jul;41(7):1321-1328. doi: 10.1007/s00296-021-04813-7. Epub 2021 Mar 1. PMID: 33646342; PMCID: PMC7917371.
- O'Neill SC, Baker JF, Fitzgerald C, et al. (2014) Cauda equina syndrome: assessing the readability and quality of patient information on the Internet. *Spine (Phila Pa 1976).* May 1;39(10):E645-9. doi: 10.1097/BRS.0000000000000282. PMID: 24583736.
- Prokein B, Holtmann H, Hautmann MG, et al. (2017) Radiotherapy of painful heel spur with two fractionation regimens: Results of a randomized multicenter trial after 48 weeks' follow-up. *Strahlenther Onkol.* Jun;193(6):483-490. English. doi: 10.1007/s00066-017-1116-y. Epub 2017 Feb 27. PMID: 28243722.
- Rice RE. (2006) Influences, usage, and outcomes of Internet health information searching: multivariate results from the Pew surveys. *Int J Med Inform.* 75(1):8–28. doi: 10.1016/j.ijmedinf.2005.07.032.
- Rosenbaum AJ, DiPrea JA, Misener D. (2014) Plantar heel pain. *Med Clin North Am.* Mar;98(2):339-52. doi: 10.1016/j.mcna.2013.10.009. Epub 2013 Dec 10. PMID: 24559879.
- Sari E, Umur LF. (2021) Quality Analysis of Hallux Valgus Videos on YouTube. *J Am Podiatr Med Assoc.* Sep 1;111(5). doi: 10.7547/20-191. PMID: 33620454.
- Tejada-Llacsá PJ, Díaz-Sánchez PC, Villagaray-Pacheco NI, et al. (2020) What Messages About Osteoporosis Are Offered in Spanish Videos on YouTube? *J Clin Rheumatol.* Oct;26(7S Suppl 2):S199-S204. doi: 10.1097/RHU.0000000000001375. PMID: 32251053.
- Weisgrau S. (1995) Issues in rural health: access, hospitals, and reform. *Health Care Financ Rev.* Fall;17(1):1-14. PMID: 10153465; PMCID: PMC4193574.
- Wikipedia The Free Encyclopedia. (2020) List of most popular websites. [https://en.wikipedia.org/wiki/List\\_of\\_most\\_popular\\_websites](https://en.wikipedia.org/wiki/List_of_most_popular_websites). Accessed 11 Dec 2020