

Evaluation of YouTube videos on soft tissue sarcomas: How reliable are YouTube shares?

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ABSTRACT

Objectives: Soft tissue sarcomas of the musculoskeletal system account for approximately 8% of malignant tumors in adolescents and young adults. As the fight against cancer, a disease of our era, increases, this topic has become increasingly popular on social media. This study aims to investigate the quality and reliability of videos published on YouTube providing information on musculoskeletal soft tissue sarcomas.

Methods: In the study, the 50 videos with the highest number of views, published on YouTube and providing information about soft tissue tumors of the musculoskeletal system, were evaluated and analyzed by two different observers. Observers scored the videos according to the DISCERN and JAMA scoring systems.

Results: Of the 50 YouTube videos evaluated, the most extended video was 1 hour 29 minutes 28 seconds, while the shortest video was 45 seconds. The highest number of views was 145,122. Statistically significant high agreement was obtained between observers regarding DISCERN and JAMA scores (ICC=0.734 and P<0.01). When average DISCERN scores were evaluated, video content quality was 12% very poor, 56% poor, 26% average, and 6% good.

Conclusions: Video content providing accurate and reliable information on soft tissue sarcomas should be created so patients can understand it, with proper references, and curated by healthcare professionals. Collaboration with healthcare professionals should be sought to enhance the quality and reliability of video content on YouTube.

Keywords: Sarcoma, neoplasms, connective and soft tissue, information dissemination, patient education, social media

Soft tissue sarcomas are rare, constituting approximately 1% of all malignant tumors. Although they can occur in various age groups, they make up about 8% of all malignant tumors in adolescents and young adults [1]. Cancer in adolescents and young adults constitutes a significant population. It has been the subject of recent studies, becoming increasingly

popular in the media as the fight against cancer gains momentum. The most common cancers seen in adolescents and young adults include lymphoma, melanoma, testicular cancer, sarcomas, thyroid cancer, and breast cancer [2]. Soft tissue sarcomas have more than fifty histological subtypes, each with unique characteristics. Given their oncological features, accurate

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diagnosis and determination of personalized treatment strategies are crucial. The management of these cancers requires a multidisciplinary team, including pathologists, nuclear medicine specialists, medical oncologists, radiologists, radiation oncologists, and orthopedic oncologists. Orthopedic oncology focuses on primary and metastatic bone and soft tissue tumors affecting the musculoskeletal system.

Advancements in medicine, advanced imaging techniques, and surgical innovations significantly impact survival rates. The internet, one of the fastest ways to access information, is widely utilized today. YouTube hosts numerous content on soft tissue sarcomas. Many videos uploaded by doctors, healthcare institutions, news channels, patients, and their families serve as a second opinion for patients [3]. Therefore, videos must have high-quality and reliable content. This study aims to evaluate the reliability of YouTube videos regarding 'Soft Tissue Sarcoma'.

METHODS

Since the study was conducted as an open-access

video research on YouTube, it did not require approval from an ethics committee. We aim to evaluate the reliability of content shared on widely used and openly accessible social platforms like YouTube regarding soft tissue sarcoma in the musculoskeletal system. Therefore, on February 22, 2024, videos related to 'soft tissue sarcoma' in the musculoskeletal system available on YouTube were screened (YouTube, www.youtube.com YouTube LLC, San Bruno, CA, USA). The term "soft tissue sarcoma" was entered into the YouTube search bar to begin a search. Videos with non-English language, advertisements, and those shorter than 30 seconds were excluded from the study. The top 50 most viewed videos meeting these criteria were evaluated. Video type, length, uploaders, view count, comment count, and like and dislike counts were recorded. While evaluating the videos, they were divided into subgroups according to the mentioned contents.

The daily view count was calculated by normalizing the total view count of the video to the number of days since it was uploaded. The like count was calculated as a percentage of the total likes and dislikes, yielding the Video Power Index (VPI) [4]. The quality

Table 1. Discern scoring system

DISCERN Scoring System						
Section	Questions	No	Partly	Yes		
Reliability of the publication	1.Explicit aims	1	2	3	4	5
	2.Aims achived	1	2	3	4	5
	3.Relevance to patients	1	2	3	4	5
	4.Source of information	1	2	3	4	5
	5.Currency(data) of information	1	2	3	4	5
	6.Bias and balance	1	2	3	4	5
	7.Additional sources of information	1	2	3	4	5
	8.Reference to areas of uncertainty	1	2	3	4	5
Quality of information on treatment choices	9.How treatment works	1	2	3	4	5
	10.Benefits of treatment	1	2	3	4	5
	11.Risk of treatment	1	2	3	4	5
	12.No treatment options	1	2	3	4	5
	13.Quality of life	1	2	3	4	5
	14.Other treatment options	1	2	3	4	5
	15.Shared decision making	1	2	3	4	5

of the videos was scored using the DISCERN and JAMA scoring systems by two different observers who are orthopedic specialists. The DISCERN scoring system is a tool developed to evaluate the quality of health-related videos on YouTube. It consists of 15 questions, each rated on a scale from 1 to 5. Videos are given a total score ranging from 15 to 75. The first eight questions focus on the reliability of the video, while the last seven questions emphasize treatment options and their suitability. The scoring system categorizes scores as follows: 63-75 as 'excellent,' 51-62 as 'good,' 39-50 as 'average,' 28-38 as 'poor,' and below 28 as 'very poor' (Table 1) [5]. As mentioned in Table 2, the JAMA scoring system evaluates videos based on four criteria. Each criterion is assessed by awarding 1 or 0 points, resulting in a total score of 4 [6]. DISCERN, and JAMA scores were recorded by calculating the average scores of 2 observers.

Statistical Analysis

The data was collected, compared, and analyzed using the Microsoft Excel spreadsheet program (Version 2013, Microsoft Corporation) for calculations and SPSS for Windows 23.0 (SPSS Inc) for statistical analysis. Descriptive statistics utilized mean, standard deviation, median, lowest, highest, frequency, and ratio values. The distribution of the variables was assessed using the Kolmogorov-Smirnov test. Two Independent t-tests were conducted for comparing two independent groups with a normal distribution, while a One-way Analysis of Variance (One-Way ANOVA) was employed for comparing more than two groups. The Kruskal–Wallis H test was performed to compare

more than two independent groups that did not adhere to a normal distribution. If differences between groups were detected, the Mann-Whitney U test was used to identify the origin of these differences. Categorical variables were analyzed using the chi-squared test, and statistical significance was set at a P-value of less than 0.05.

RESULTS

Of the 50 videos meeting the study criteria for soft tissue sarcomas of the musculoskeletal system, 11 were animations, and 39 were actual footage. When examined according to publishers, the majority of the videos, 44% (n=22), were uploaded by health channels. The majority of uploaders, 70% (n=35), were non-physicians. Regarding video content, the highest percentage, 32% (n=16), was related to 'general information,' followed by 28% (n=14) for 'treatment options.' Additionally, videos containing patient experiences constituted 20% of all videos (Table 3). Categorical parameters regarding the videos are shown as percentage graphs in Fig. 1.

The most extended video duration is 1 hour, 29 minutes, and 28 seconds, while the shortest is 45 seconds. The oldest uploaded video was posted on January 5, 2015. The average video duration was calculated as 00:08:56±00:18:07 (hh:mm:ss). The average number of video views was 23,056.12±32,673.31, with an average time since video upload of 1,616.41±957.9 days. The average daily views were 16.12±23.22. The most viewed video among the shared videos had 145.122

Table 2. JAMA scoring system

Section	JAMA Scoring System	Rating	
		Yes	No
Authorship	Authors and contributors, their affiliations, and relevant credentials should be provided	1	0
Attribution	References and sources for all content should be listed clearly, and all relevant copyright information should be noted	1	0
Disclosure	Website “ownership” should be prominently and fully disclosed, as should any sponsorship, advertising, underwriting, commercial funding arrangements or support, or potential conflicts of interest	1	0
Currency	Dates when content was posted and updated should be indicated	1	0

Table 3. General features of the videos

	Frequency	Percentage
Image type (real/animation)		
Animation	11	22
Real	39	78
Publishers		
Cancer charity channel	4	8
Education channel	7	14
Health channel	22	44
Hospital channel	10	20
News channel	2	4
University channel	5	10
Uploaders		
Non-phsycian	35	70
Phsycian	15	30
Video contents		
Diagnostic process	5	10
General information	16	32
Multidisiplinary management	1	2
Operation video	1	2
Patient experience	10	20
Sarcoma symptoms	3	6
Treatment options	14	28

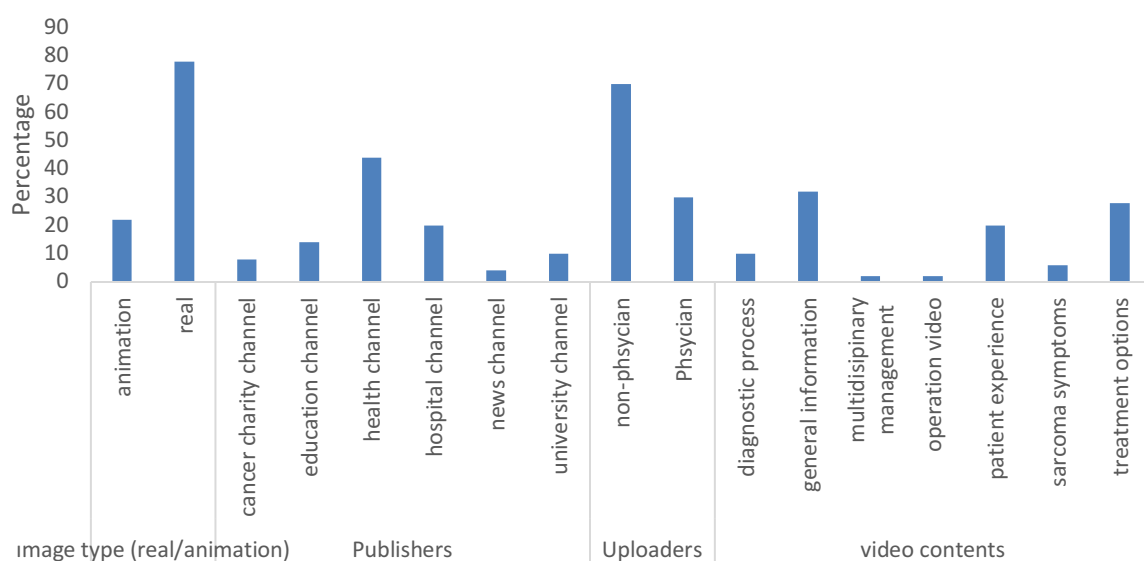


Fig. 1. Percentage graphs of categorical parameters related to videos.

Table 4. Descriptive statistics of quantitative parameters for videos

	Mean±standart deviation	Median (minimum-maximum)
Video length (hh:mm:ss)	00:08:56±00:18:07	00:03:30 (00:45:00-1:29:28)
View count	23056.12±32673.31	8600 (131-145122)
Time since video upload (days)	1616.41±957.9	1415 (182-3884)
View count (daily)	16.12±23.22	7.37 (0.18-112.06)
Comment count	25.19±51.36	3 (0-268)
Like count	157.72±222.68	57 (1-1149)
Dislike count	6.08±9.96	0.5 (0-37)
VPI	97.38±3.93	99.84 (80-100)

VPI=Video Power Index

views, and the most recent video was uploaded 182 days ago. Table 4 summarizes the data related to video duration, upload date, and view count, as well as VPI, comment, like, and dislike counts.

In Table 5, the highest average likes by video uploaders was 381.25±526.42 for the "cancer charity channel" group. The VPI index was highest at 98.41% in the "university channel" group.

The inter-observer DISCERN scoring measurements yielded statistically significant very high agreement (intraclass correlation coefficient (ICC)=0.918; P<0.001). Similarly, a statistically significant high agreement was obtained for inter-observer JAMA measurements (ICC=0.734; P<0.001) (Table 6).

No statistically significant difference exists in average DISCERN scores among uploaders (P=0.200). The average DISCERN score for non-physicians is 35.53, and for physicians, it is 37.27. The average JAMA score is 2.46 in the non-physician group, while in the physician group, it is 2.8. The VPI average is 97.3±4.46 in the Non-physician group and 97.59±2.39 in the Physician group. However, there is no statistically significant difference in JAMA scores and VPIs by uploaders (P>0.050) (Table 7).

When the average DISCERN scores are evaluated, the quality of the videos is as follows: 12% very poor, 56% poor, 26% average, and 6% good (Table 8).

Table 5. Video features by publishers

	Comment count	Like count	Dislike count	VPI
Cancer charity channel	99±147.07	381.25±526.42	10.75±15.56	96.58±5.14
	29 (0-268)	187.5 (1-1149)	5 (0-33)	98.6 (89.13-100)
Education channel	6.14±10.32	117.14±116,85	6±13.75	98.2±3.57
	2 (0-29)	63 (10-345)	0 (0-37)	100 (90.31-100)
Health channel	13.84±27.56	91.5±179.16	3.18±6.46	97.37±4.86
	2 (0-94)	8 (2-629)	0 (0-26)	100 (80-100)
Hospital channel	28.11±42.42	198±167.07	8.2±11.21	97.18±2.49
	10 (1-132)	164.5 (4-511)	2 (0-33)	96.49 (93.93-100)
News channel	38.5±14.85	265.5±23.33	15±8.49	94.79±2.44
	38.5 (28-49)	265.5 (249-282)	15 (9-21)	94.79 (93.06-96.51)
University channel	50±86.6	203.4±241.31	7.4±10.43	98.41±2.18
	0 (0-150)	43 (23-562)	0 (0-22)	100 (95.84-100)

Data are shown as mean±standard deviation and median (minimum-maximum). VPI=Video Power Index

Table 6. Assessment of interobserver agreement

	ICC (95% CI)	P value
DISCERN	0.918 (0.855-0.953)	<0.001
JAMA	0.734 (0.532-0.849)	<0.001

ICC=intraclass correlation coefficient, CI=Confidence interval

DISCUSSION

Based on an extensive literature review, our study is the first and only investigation regarding the reliability of videos about soft tissue sarcomas of the musculoskeletal system. The results will shed light on the content and quality of videos related to soft tissue sarcomas, contributing to the existing literature.

As of January 2024, the global internet user count reached 5.35 billion, representing 66.2% of the world's population. Among them, 5.04 billion individuals, equivalent to 62.3% of the global population, were active social media users [7]. With more than 3 billion monthly active users, Facebook continues to lead as the most popular social media platform, followed by

YouTube, which has approximately 2.5 billion monthly active users [8]. The absence of video limitations, open access to video content, and widespread usage on the YouTube platform facilitated the planning of our study as a YouTube investigation.

In their study on internet usage among orthopedic patients, Burrus et al. [9] reported that 84.9% of 1296 patients had internet access, and among those with internet access, 64.7% used the internet to obtain orthopedic information. They also emphasized that younger patients tended to use the Internet for orthopedic information at a higher rate [9].

Innovative technologies today are creating a new language of communication worldwide. While rapid access to information can provide great convenience,

Table 7. Comparison of quantitative parameters according to uploaders

	Uploaders		test statistics	P value*
	Non-phsycian	Phsycian		
DISCERN	35.53±7.62	37.27±6.36	202	0.200
	33 (26-57.5)	38.5 (27.5-49)		
JAMA	2.46±0.65	2.8±0.49	179.5	0.069
	2.5 (1.5-4)	3 (2-4)		
VPI	97.3±4.46	97.59±2.39	234	0.519
	100 (80-100)	96.77 (93.93-100)		

Data are shown as mean±standard deviation and median (minimum-maximum). VPI=Video Power Index

*Independent Samples t test

Table 8. Evaluation of videos in terms of quality according to average DISCERN scores

	Frequency	Percentage
DISCERN		
Very poor	6	12
Poor	28	56
Average	13	26
Good	3	6

many sources on the internet need to be regulated, leading to the spread of low-quality and potentially inaccurate content to patients [10].

The total number of views for only the first 50 videos on YouTube related to soft tissue sarcomas as of February 22, 2024, 1,152,896, indicates interest in this orthopedic-specific topic. The literature review reveals that previously, only videos related to soft tissue sarcomas on YouTube had yet to be examined. In a study conducted by Clerici *et al.* [11] in 2011, using the keyword groups 'pediatric soft tissue sarcoma,' 'rhabdomyosarcoma,' and 'soft tissue sarcoma in children,' they examined 149 videos. They found that the majority of these videos were uploaded by family members (82.5%). They also reported that 94 videos were dedicated to deceased patients [11]. However, in the mentioned study, videos were categorized based on their content and publishing channels, and a valid scoring system regarding quality should have been utilized. In our current study, a significant portion of video content focuses on providing general information about soft tissue sarcoma (32%), followed by videos concerning treatment options (28%). Videos depicting patients' experiences dealing with the disease constitute a considerable proportion (20%). This indicates that videos are utilized as a tool for patients and their families to share impressions and experiences, demonstrating how they cope with the disease. As highlighted in the literature, various scoring systems are used to assess the quality and reliability of online videos [12]. Our study evaluated video content using widely recognized scoring systems such as DISCERN and JAMA, obtaining comparable results. Furthermore, to enhance the reliability of the study, two independent observers independently scored the same videos at different times, and a high level of agreement was found between the two observers ($P < 0.001$).

In another study examining YouTube content related to cancer rehabilitation, 53 videos were analyzed, with the majority uploaded by academic institutions, university channels, health-related websites, and physiotherapists. They reported that frequently mentioned content was related to cancer rehabilitation basics, but most of the evaluated videos were of low quality and lacked sufficient information about cancer rehabilitation [13]. Consistent with the literature, when examining the channels that uploaded the videos, the top three were health, hospital, and education channels,

respectively. Additionally, according to the DISCERN scoring, 12% of the videos in our study were rated as 'very poor,' and 56% were rated as 'poor.' Previous studies have highlighted the tendency for information shared by physicians to be superior to videos uploaded by non-physicians [10]. However, in our study, considering the uploaders of the videos, no statistically significant difference was found between physician and non-physician uploaders regarding DISCERN, JAMA scores, and VPI.

Similar studies in the literature on various health conditions have also reported different rates regarding the quality and accuracy of the videos. Şahin *et al.* [14], Çitgez *et al.* [15], and Kanlıöz *et al.* [16] reported that the quality of the videos related to the subject we worked on is low, consistent with the results we obtained. However, Askin *et al.* [17], in their YouTube study on transcranial magnetic stimulation in stroke, reported that the majority of the videos were of moderate quality and partially had sufficient data.

Studies emphasizing the importance of sharing patient stories and experiences during the cancer journey are increasing. It has been shown that these shared experiences have a positive impact on both those sharing their own cancer experiences and cancer survivors [18]. Although most of the videos examined in our study were of low quality, the shared information about patient experiences can benefit patients and their families.

Limitations

This study has some limitations. First, the sample size is relatively small. However, due to the open-access nature of the YouTube platform and the absence of time restrictions on videos, we believe that the videos examined adequately represent the subject matter. Second, including only English-language videos is another limiting factor. However, considering that English is the most widely spoken language globally, we believe that this does not significantly undermine the validity of the study.

CONCLUSION

As a result, it is imperative that YouTube content creation incorporates evidence-based practices and utilizes referenced information to provide safer video

content. Plans should be made to ensure that accurate and reliable information about "soft tissue sarcoma" is delivered to patients in an understandable manner, using appropriate sources and by healthcare professionals. Furthermore, efforts should be directed toward improving the quality of video content created by cancer survivors and individuals fighting cancer. To enhance the reliability of YouTube videos as much as possible, production should be facilitated by healthcare institutions, scientific organizations, and healthcare professionals.

Authors' Contribution

Study Conception: AY, ŞAŞ; Study Design: AY, HSC; Supervision: ND; Funding: N/A; Materials: ND, TC; Data Collection and/or Processing: ŞAŞ, TC; Statistical Analysis and/or Data Interpretation: AY; Literature Review: AY, ŞAŞ; Manuscript Preparation: AY, ŞAŞ and Critical Review: ND.

Ethics approval

Since the study was conducted as an open-access video research on YouTube, it did not require approval from an ethics committee.

Conflict of interest

The authors disclosed no conflict of interest during the preparation or publication of this manuscript.

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