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Original Articles

Evaluating YouTube as a source of information on hemifacial spasm

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ABSTRACT

Background and Objectives: Patients increasingly turn to YouTube for trustworthy health-related information, prompting a study to evaluate the quality and reliability of videos about hemifacial spasms (HFS) available on the platform.

Materials and Methods: In August 2024, a systematic search was conducted using a formal strategy to identify relevant videos. Two independent neurology resident physicians reviewed each video, scoring it with the validated modified DISCERN (mDISCERN) tool for reliability and the Global Quality Scale (GQS) for content quality. Videos were categorized based on their purpose and assessed for video/audio quality, accuracy, comprehensiveness, and procedure-specific content.

Results: The study included 44 videos. According to GQS, 17 (38.6 %) were rated as high quality, 14 (31.8 %) as good, 5 (17 %) as medium, and 8 (18.2 %) as poor quality. On the mDISCERN scale, 24 (54.5 %) were deemed reliable, while 9 (20.5 %) were unreliable. Videos created by physicians, academic institutions, and reputable health information websites scored higher on both mDISCERN and GQS compared to other sources. A strong positive correlation was found between mDISCERN and GQS scores ($r = 0.925$, $p < 0.001$), indicating that higher reliability was linked to better content quality.

Conclusion: YouTube offers valuable resources for HFS patients and caregivers. Videos produced by healthcare professionals and academic institutions offered particularly accurate insights, enhancing patients' understanding of the condition's pathophysiology and treatment options, and serving as a useful complement to healthcare professionals' knowledge. Healthcare professionals and academic institutions have a pivotal role in creating and promoting high-quality educational content. Future efforts should focus on increasing the availability of reliable, expert-verified videos to improve overall quality of information accessible to patients.

1. Introduction

Hemifacial spasm (HFS) is a rare neurological disorder characterized by involuntary and intermittent contractions of the muscles on one side of the face, affecting 14.5 per 100,000 women and 7.4 per 100,000 men [1]. These spasms typically begin around the eye and may progress to involve other facial muscles, leading to noticeable and often distressing facial twitching. The condition is often caused by irritation or compression of the facial nerve, which can occur due to various factors such as vascular anomalies or tumors [1]. Although HFS is not life-threatening, the burden of the disease extends beyond physical symptoms, encompassing emotional, social, and economic dimensions that can significantly impact a patient's overall well-being.

Treatment options for HFS include medications, botulinum toxin injections, and surgical interventions, with varying degrees of effectiveness depending on the severity and underlying cause of the condition [2]. However, managing hemifacial spasms effectively requires accurate and up-to-date information, which can be challenging to obtain.

Patients frequently turn to the internet – one of the largest sources of information today, to gather details about their health issues before consulting medical professionals. Especially during the pandemic, where the desire for quality information is even higher as patients suffering from chronic disorders try to avoid visits to their physicians or to enter a hospital.

In recent years, the availability of digital health resources has expanded significantly, with platforms like YouTube becoming popular

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sources of medical information. YouTube (YouTube, LLC, San Bruno, CA, USA) has become a rapidly advancing online video platform, generating nearly two billion views every day [3,4]. Every single day, more than 1 billion YouTube videos are watched, and there are 2.5 billion YouTube users as of March 14, 2023, and more than 500 h of YouTube videos are uploaded per minute (Available at: https://www.omnicoreagency.com/youtube-statistics/).

YouTube offers significant potential for providing health-related information due to its popularity and accessibility, providing visual and auditory elements, making complex health information more engaging and easier to understand for a general audience. However, the quality and accuracy of the content can vary widely since videos are uploaded by both healthcare professionals and non-experts, and the accuracy, reliability, and quality of health-related content on the platform are often uncertain [5]. Furthermore, relying on these videos for medical information presents several challenges, including the use of complex medical terminology, the absence of peer review, and often disorganized content [6]. Given these factors, our focus on YouTube is intended to address the platform's significant role in shaping health perceptions and its potential as both an educational tool and a source of misinformation. Therefore, it is crucial to evaluate the reliability of online resources to ensure that patients, caregivers, and their families receive trustworthy and useful information.

Various researches have been published conducting YouTube video analysis studies in almost every field of medicine [3,4,5,6,7,8,9]. There has been no published study on the content reliability and quality of HFS related videos broadcast on YouTube. Hence, we aimed to assess the quality of information available on YouTube about HFS by using the validated modified DISCERN (mDISCERN) and the Global Quality Score (GQS) tools [4,5]. By conducting a cross-sectional analysis, we sought to provide insights into the reliability of the online content and its potential impact on patient care and education.

2. Materials and methods

This study was a cross-sectional observational analysis conducted in August 2024. To avoid any external factor that might affect the data gathering, no YouTube account was used, and Google Chrome was placed in "incognito mode." A comprehensive search on YouTube using the following keywords with different combinations: "hemifacial spasm," OR "facial twitching," AND "prevention and treatment," OR "exercise". For each search query, the top 90 results were exported to a separate database (Microsoft Excel) for manual review. Along with the title of each result, the table also included parsed meta information such as the title, source, upload date, number of views, likes, dislikes, and comments. Only the first 90 videos that appeared for each keyword will be evaluated, as studies have shown that 90 % of internet users did not view more than three pages (corresponding to 30 videos per page), and duplicates will be removed. The "Relevance-Based Ranking" was used to filter the YouTube search for this study. Based on past studies of Internet search engines, the majority of visitors do not go beyond the first three pages of search results [9,10].

2.1. Inclusion and exclusion criteria

The YouTube videos included in this research focused specifically on the symptoms, causes, and treatment options for hemifacial spasms that are available for public viewing. Voice-over videos that were between 1 min and twenty minutes in length and contained English dialogue or translated English subtitles were incorporated into the research. No restrictions were placed on the upload dates to capture a comprehensive snapshot of available content as of August 2024. The duration of the videos is based on similar YouTube research [3–9]. Previous studies have indicated that the majority of YouTube videos have a duration of less than 10 min, and audiences mostly exhibit interest in watching these shorter video formats.

Videos lacking aural or visual components, those with misleading titles (e.g., with hemifacial spasm but features other diseases), no sound, duplicate entries, irrelevant videos (e.g., music or commercial videos), surgical videos not available for public viewing, patient and medicine testimonials not relevant to the research questions, or videos uploaded in a language other than English were all excluded from consideration (Fig. 1).

2.2. Variables extracted

Quantitative characteristics of the videos, including video identification, title, total views, time since upload, video duration, number of comments, likes, dislikes, view ratio, like ratio, and video power index (VPI), were extracted. The like ratio was calculated as "(number of likes / (number of likes + number of dislikes) × 100," the view ratio as "number of views since upload / number of days since upload," and the VPI as "like ratio × view ratio / 100.".

2.3. Grouping of videos and video parameters

Manual curation of each relevant video was compiled in another final database using Microsoft Excel. A total of 463 videos were identified through the search, and 153 videos related to the study topic were subjected to a preliminary evaluation. Two independent senior neurology residents (KLP and AJRS) with clinical experience in movement disorders, including the evaluation and management of hemifacial spasm, reviewed the specified videos separately in August 2024. In cases where the scoring using the mDISCERN and GQS scales differed by at least two points, a third author (RDGJ), who is a board-certified neurologist and movement disorder specialist (RDGJ), was consulted to resolve discrepancies and ensure consistent expert evaluation.

The video sources were classified into seven categories: academic institutions/ professional organizations/ associations, physicians, healthcare professionals other than physicians (e.g., dietitians, nurses, and physical therapists), health information websites, news, and independent users. The videos were also grouped according to the target audience as patients, healthcare professionals, the general population, and unspecified [3,4].

In the assessment of the videos, those that included any erroneous or accurate scientific information related to HFS were classified as either misleading or accurate respectively. Misleading content included videos that presented inaccurate claims about HFS, such as suggesting unproven or debunked treatments (e.g., homeopathic remedies with no clinical evidence) or misrepresenting the disease mechanism (e.g., attributing HFS solely to lifestyle factors without mention of neurological origins). Accurate videos provided scientifically validated information, including proper descriptions of symptoms, pathophysiology, and evidence-based treatment options (e.g., botulinum toxin injections as the gold standard). Videos devoid of relevant information were categorized as neither accurate nor misleading. Additionally, videos presenting a combination of both erroneous and accurate information were classified as misleading and were removed from the selection.

2.4. Quality and reliability assessment

The videos were determined for their reliability using a validated 5-point mDISCERN scale, which is developed from the DISCERN reliability tool for the evaluation of written health information. It consists of a total of five questions that can be scored between 0 and 5, answered as "yes" or "no." The GQS tool used in previous studies [3,4,5,6,7,8,9] to evaluate the flow and usability of the YouTube videos was also employed (Table 1).

2.5. Video parameters

The number of views, likes, and video duration are included. The

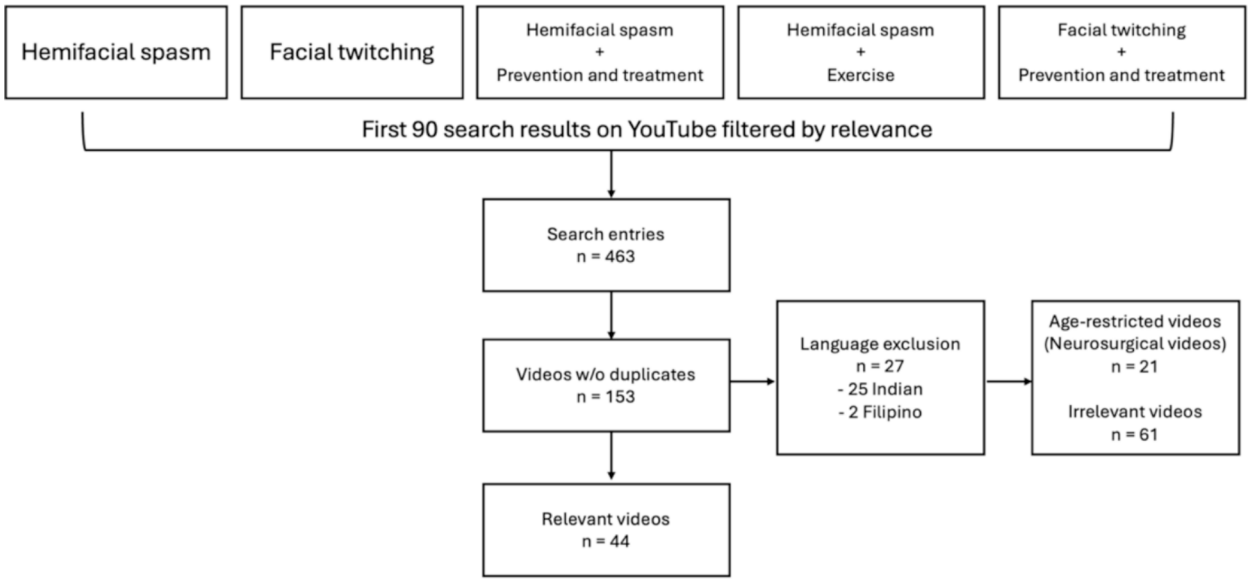

Fig. 1. Search strategy and inclusion criteria.

Table 1
Mean and ranges for all quantitative video metrics for all videos analyzed.

	Minimum	Maximum	Mean
Number of views	67	38,1599	30,963.84 ± 69,364.24
Number of likes	1	1500	218.02 ± 368.07
Number of comments	1	167	35.74 ± 50.80
Number of subscribers	7	1,100,000	83,510.47 ± 19,7605.61
Duration	1 min	23.01 min	5.42 ± 5.08 min
Time elapsed since uploaded	6 months	14 years	5.04 ± 3.69 years
Like ratio	88.89	100	97.83 ± 3.03
View ratio	0.14	203.68	23.44 ± 46.95
Video power index	0.14	194.91	23.32 ± 46.37

video sources were classified into six categories: academic institutions/universities, physicians, healthcare professionals other than medical doctors, health information websites, news agencies, and independent uploaders.

2.6. Statistical methods

Descriptive statistics, including means, medians, ranges, and standard deviations, were used for the continuous variables. Pearson correlation test was used to find differences between categorical variables, and one-way ANOVA was used to assess differences based on more than two groups. Inter-rater agreement was calculated using intra-class correlation coefficients. Statistical analyses were conducted using SPSS version 25, with $p < 0.05$ considered statistically significant.

3. Results

Among the 453 videos found for the study, 300 were duplicates, 109 were excluded in the study for the following reasons: language exclusion (n = 27), age-restricted videos, which mainly encompasses neurosurgical videos (n = 21), and irrelevant videos (n = 61) (e. g., commercials, other disease entities, videos less than 1 min, videos with no sound). A total of 44 videos were included in the sample.

3.1. Summary of key video metrics

Key metrics include views, likes, comments, channel subscribers, video durations, and upload times. These metrics demonstrate significant variability in video performance and audience engagement.

Table 1 summarizes key quantitative metrics for HFS YouTube videos. Views ranged from 67 to 381,599, with a mean of 30,963.84 ± 69,364.24. Likes ranged from 1 to 1,500, averaging 218.02 ± 368.07. Comments varied from 1 to 167, with a mean of 35.74 ± 50.80. Channel subscribers ranged from 7 to 1,100,000, with a mean of 83,510.47 ± 197,605.61. Video durations spanned from 1 to 23.01 min, with an average of 5.42 ± 5.08 min. Time since upload ranged from 6 months to 14 years, with a mean of 5.04 ± 3.69 years. Like ratios varied between 88.89 and 100, with an average of 97.83 ± 3.03. The Video Power Index (VPI) ranged from 0.14 to 194.91 (mean 23.32 ± 46.37), and the view ratio ranged from 0.14 to 203.68 (mean 23.44 ± 46.95). These metrics highlight significant variability in video performance and engagement.

3.2. Content quality and reliability analysis

Table 2 evaluates HFS YouTube videos based on GQS and mDISCERN criteria, highlighting significant variations in content quality and reliability. Physicians contributed the most videos (56.8 %), with 36.4 % rated as good reliability and 29.5 % as excellent quality. Academic institutions (13.6 %) also performed well, with 50 % rated as good or excellent. Healthcare professionals and independent YouTubers (11.4 % each) showed lower quality, with only 2.3 % rated as good. Health websites (4.5 %) and a news agency.

3.3. Source-specific video performance

This section summarizes the engagement metrics (views, likes, comments, duration, and publication year) across different uploader types and have been summarized in Table 3.

Academic institutions and physicians generally garnered higher engagement, while health websites and news agencies had minimal views and likes. videos from academic institutions and universities generally garnered high engagement, with one 2009 video reaching over 380,000 views and 1,500 likes, and a 2018 video receiving 256,692 views and 579 likes. Physicians' videos, such as a 2023 video, also saw strong engagement, with 74,345 views and 1,200 likes. Independent users and healthcare professionals (non-physicians) had notable engagement as well, like a 2019 healthcare professional video with 69,760 views and 1,000 likes. In contrast, health websites and news agencies had the least engagement, with many videos receiving minimal

Table 2
Evaluation of YouTube videos using the Global Quality Score and modified DISCERN (mDISCERN) criteria.

	Academic institutions/ Universities *n = 6* (13.6 %)	Physicians *n = 25* (56.8 %)	Healthcare professionals (non-physicians) *n = 5* (11.4 %)	Health information websites *n = 2* (4.5 %)	Independent users/ Youtubers *n = 5* (11.4 %)	News agency *n = 1* (2.3 %)	Total
mDISCERN Score							
Good reliability	3 (6.8 %)	16 (36.4 %)	1 (2.3 %)	2 (4.5 %)	2 (4.5 %)	–	24 (54.5 %)
Moderate reliability	1 (2.3 %)	5 (11.4 %)	2 (4.5 %)	–	2 (4.5 %)	1 (2.3 %)	11 (25.0 %)
Low reliability	2 (4.5 %)	4 (9.1 %)	2 (4.5 %)	–	1 (2.3 %)	–	9 (20.5 %)
Global Quality Score							
Excellent quality	2 (4.5 %)	13 (29.5 %)	–	2 (4.5 %)	–	–	17 (38.6 %)
Good quality	3 (6.8 %)	4 (9.1 %)	3 (6.8 %)	–	4 (9.1 %)	–	14 (31.8 %)
Moderate quality	–	4 (9.1 %)	–	–	–	1 (2.3 %)	5 (11.4 %)
Generally poor quality	–	4 (9.1 %)	1 (2.3 %)	–	–	–	5 (11.4 %)
Poor quality	1 (2.3 %)	–	1 (2.3 %)	–	1 (2.3 %)	–	3 (6.8 %)

mDISCERN – modified DISCERN.

views and likes, such as a 2020 health website video with only 25 likes and 1,850 views. Overall, academic institutions and physicians typically generated more views and likes, while independent users and healthcare professionals showed mixed results.

3.4. Reliability and quality score comparison

Of 44 videos analyzed, most of those receiving high GQS and mDISCERN scores covered the pathophysiology, signs and symptoms, diagnosis, and treatment of HFS. Table 4 presents the comparison of the reliability and quality scores of information between different types of YouTube videos by uploader. Based on the results, they demonstrated differences across various uploader types, although these differences were not statistically significant, as indicated by the p-values (mDISCERN = 0.192, GQS = 0.385). Physicians' videos had the highest average mDISCERN score (M = 3.92) and a relatively high GQS (M = 3.96), indicating both good reliability and quality. Health information websites, despite their small representation (n = 2), achieved the highest scores for both mDISCERN (M = 4.5) and GQS (M = 5), suggesting exceptional reliability and quality. Academic institutions' videos also performed well, with mDISCERN (M = 3.25) and GQS (M = 3.75), reflecting moderate to high reliability and quality. In contrast, healthcare professionals (non-MD) and independent YouTubers had lower average scores in both metrics, with independent YouTubers receiving a particularly moderated mDISCERN score (M = 3) and a GQS score of 3.5. The news agency, with just one video, scored consistently at 3 for both metrics. These findings suggest that content from physicians and academic institutions tends to offer better reliability and quality, though the small sample size of certain groups may limit the generalizability of these results.

3.5. Engagement metrics and correlations

Summarized in Table 5 are the relationships between user engagement metrics (e.g., views, likes, comments, and subscribers) and the quality of hemifacial spasm videos on YouTube, measured by mDISCERN and GQS scores. Significant positive correlations are observed between the number of views and several engagement metrics, including the number of likes ($r = 0.746$, $p < 0.001$), number of comments ($r = 0.680$, $p < 0.001$), number of subscribers ($r = 0.698$, $p < 0.001$), View Ratio ($r = 0.509$, $p < 0.0001$) and Video power index ($r = 00.492$, $p < 0.001$). These correlations indicate that higher views are associated with more interaction and engagement. Interestingly, a negative correlation exists between views and the like ratio ($r = -0.446$, $p = 0.003$), suggesting that videos with higher views do not necessarily have proportionally higher likes relative to views.

The number of likes is strongly correlated with the number of comments ($r = 0.845$, $p < 0.001$), number of subscribers ($r = 0.584$, $p < 0.001$), view ratios ($r = 0.750$, $p < 0.001$), and the video power index ($r = 0.746$, $p < 0.001$), showing that videos receiving more likes tend to be more engaging overall. However, the negative correlation between the number of likes and like ratio ($r = -0.344$, $p = 0.027$) implies that videos with higher likes do not always have a higher like-to-view ratio. Additionally, the number of comments is moderately correlated with view ratio ($r = 0.481$, $p = 0.011$) and video power index ($r = 0.481$, $p = 0.011$), suggesting that engagement in the form of comments is also indicative of video performance. Moreover, number of subscribers moderately correlated with view ratio ($r = 0.397$, $p = 0.011$) and video power index ($r = 0.397$, $p = 0.011$), suggest that as the number of subscribers increases, there is a corresponding increase in both the view ratio and the video power index, indicating that subscriber count plays a role in enhancing video performance metrics.

3.6. Video duration and quality correlations

A significant relationship was found between video duration and quality, with longer videos offering more comprehensive information as indicated by higher mDISCERN and GQS scores. Significant correlations were found between duration time and mDISCERN ($r = 0.342$, $p = 0.026$) and GQS scores ($r = 0.319$, $p = 0.040$), implying that longer videos may offer more comprehensive or higher-quality information. The strong positive correlation between mDISCERN and GQS scores ($r = 0.925$, $p < 0.001$) reinforces the consistency of these two measures in assessing video quality. Finally, the view ratio and video power index are perfectly correlated ($r = 1.000$, $p < 0.001$), highlighting their identical influence in assessing video performance. These findings suggest that while engagement metrics like the number of views and likes are strong indicators of video popularity, they do not always reflect the quality of information. This highlights the need for using established quality measures like mDISCERN and GQS to ensure reliable health information is being presented in YouTube videos.

Table 3
Features of included YouTube videos evaluated.

Source Uploader	Video number	Year of publication	Number of likes	Duration time in minute	Number of views	Number of subscribers	Number of comments
Academic institution/ Universities	2	2014	255	2:47	61,163	37,300	75
	5	2018	579	1:46	256,692	42,200	
	8	2021	80	4:16	10,120	31,100	2
	9	2018	44	1:15	14,808	42,200	
	12	2021	47	22:23	4083	1740	4
	30	2018	2	2:37	315	15,200	0
	1	2009	1500	3:02	381,599	1,100,000	
Physicians	3	2018	0	1:31	23,809	7030	
	4	2023	1200	13:47	74,345	13,2000	107
	6	2020					
	7	2017	374	9:21	72,128	2580	6
	10	2021	92	1:04	19,005	1360	12
	11	2021	240	8:38	21,531	1980	52
	16	2022		1:52	3534	7250	
	17	2013	16	5:00	2265	23,300	3
	18	2016	14	1:05	2600	490	0
	19	2014	17	13:11	2640	1540	4
	20	2021	29	2:47	2701	31,100	2
	22	2013	54	23:01	5285	6340	9
	24	2022	143	3:46	22,115	101,000	0
	25	2018	271	8:30	30,497	732	69
	26	2019	378	4:44	25,909	15,800	
	27	2018	45	1:09	10,090	1250	3
	32	2023	1	2:09	197	126	0
	33	2021	2	3:39	475	12,200	0
	34	2024	50	7:08	1823	19,700	0
	35	2020	3	1:53	220	7	0
	37	2019	2	4:18	625	15,800	0
	38	2021	22	2:32	504	1370	2
	40	2018	121	8:59	7798	19,700	51
	43	2020	520	7:01	31,110	4190	163
Healthcare Professionals (non-physician)	13	2019	1000	8:50	69,760	201,000	167
	15	2023	1200		62,961	201,000	134
	21	2022	85	10:52	4903	201,000	21
	28	2023	58	8:23	3636	201,000	10
	36	2014	69	1:01	20,588	51,9000	20
Health information websites	14	2020	25	3:46	1850	2410	1
	39	2023	4	3:46	67	2730	0
Independent users/ Youtubers	23	2023	256	4:46	52,277	510,000	22
	31	2013	11	3:25	3726	26,300	1
	41	2015	4	9:21	841	202	0
	42	2024	12	5:10	182	26,300	2
	44	2011	86	3:47	15,245	123	9
News agency	29	2013	28	1:00	5423	2,3300	14

Table 4
Comparison of the reliability and quality scores of information between different types of YouTube videos by uploader.

Reliability and quality scores	Academic institutions/ Universities *n* = *6* (13.6 %)	Physicians *n* = *25* (56.8 %)	Healthcare professionals (non-physicians) *n* = *5* (11.4 %)	Health information websites *n* = *2* (4.5 %)	Independent users/ Youtubers *n* = *5* (11.4 %)	News agency *n* = *1* (2.3 %)	*p* value
mDISCERN	3.25 (1–5)	3.92 (1.5–5)	2.6 (1–4)	4.5 (4–5)	3 (1–4)	3 (3)	0.192
GQS	3.75 (1–5)	3.96 (2–5)	3 1–4)	5 (5)	3.5 (1.5–4)	3 (3)	0.385

mDISCERN – modified DISCERN score; GQS – global quality score.

3.7. Assessment of video usefulness and quality

Approximately 54.5 % of the videos were deemed useful by the mDISCERN scale. While according to the GQS scale, around 38.6 % have excellent quality, and 31.8 % have good quality content. However, 20.5 % of the videos were considered unreliable, and 6.8 % had poor quality.

4. Discussion

YouTube provides easy and immediate access to a vast amount of information, making it a common resource for patients seeking health-related content, especially for a debilitating disease like HFS. To our knowledge, this is the first study to examine the usability, reliability, and characteristics of HFS videos on YouTube.

The variability in video engagement metrics, including views, likes, and comments, underscores the diversity of available content. The findings of our study align with previous studies investigating the quality of YouTube videos about various medical issues [3–9]. Physician videos and health information websites had high mDISCERN and GQS scores, indicating the high reliability and quality, respectively, whereas content from independent users and non-physician professionals was of lower quality. Videos from academic institutions and physicians tended to garner higher engagement, with some videos achieving hundreds of thousands of views and numerous likes. These videos often provided

Table 5
Correlation between the quality of information and user engagement metrics such as views, likes, comments, and shares.

	Number of views	Number of likes	Number of comments	Duration time	Number of subscribers	mDISCERN score	GQS score	Like ratio	View ratio	Video power index
Number of views										
Pearson correlation	1	**0.746****	**0.680****	−0.090	**0.698****	0.054	0.113	**−0.446****	**0.509****	**0.492****
Significance (2-tailed)		**< 0.001**	**< 0.001**	0.572	**< 0.001**	0.729	0.471	**0.003**	**<0.001**	**0.001**
N	43	41	27	42	43	43	43	41	43	41
Number of likes										
Pearson Correlation	**0.746****	1	**0.845****	0.116	**0.584****	0.004	0.007	**−0.344***	**0.750****	**0.746****
Significance (2-tailed)	**< 0.001**		**< 0.001**	0.474	**< 0.001**	0.981	0.966	**0.027**	**< 0.001**	**< 0.001**
N	41	41	27	40	41	41	41	41	41	41
Number of comments										
Pearson correlation	**0.680****	**0.845****	1	0.118	0.152	−0.265	−0.218	−0.178	**0.481***	**0.481***
Significance (2-tailed)	**< 0.001**	**< 0.001**		0.566	0.448	0.181	0.274	0.374	**0.011**	**0.011**
N	27	27	27	26	27	27	27	27	27	27
Duration time										
Pearson correlation	−0.090	0.116	0.118	1	−0.083	**0.342***	**0.319***	0.084	0.135	0.130
Significance (2-tailed)	0.572	0.474	0.566		0.601	**0.026**	**0.040**	0.606	0.393	0.424
N	42	40	26	42	42	42	42	40	42	40
Number of subscribers										
Pearson correlation	**0.698****	**0.584****	0.152	−0.083	1	−0.046	−0.031	−0.185	**0.397****	**0.393***
Significance (2-tailed)	**< 0.001**	**< 0.001**	0.448	0.601		0.768	0.842	0.246	**0.008**	**0.011**
N	43	41	27	42	43	43	43	41	43	41
mDISCERN Score										
Pearson correlation	0.054	0.004	−0.265	**0.342***	−0.046	1	**0.925****	0.003	−0.024	−0.021
Significance (2-tailed)	0.729	0.981	0.181	**0.026**	0.768		**< 0.001**	0.984	0.880	0.895
N	43	41	27	42	43	44	44	41	43	41
GQS Score										
Pearson correlation	0.113	0.007	−0.218	**0.319***	−0.031	**0.925****	1	0.012	−0.017	−0.017
Significance (2-tailed)	0.471	0.966	0.274	**0.040**	0.842	**< 0.001**		0.943	0.915	0.914
N	43	41	27	42	43	44	44	41	43	41
Like ratio										
Pearson correlation	**−0.446****	**−0.344***	−0.178	0.084	−0.185	0.003	0.012	1	−0.216	−0.202
Significance (2-tailed)	**0.003**	**0.027**	0.374	0.606	0.246	0.984	0.943		0.175	0.204
N	41	41	27	40	41	41	41	41	41	41
View ratio										
Pearson correlation	**0.509****	**0.750****	**0.481***	0.135	**0.397****	−0.024	−0.017	−0.216	1	**1.000****
Significance (2-tailed)	**< 0.001**	**< 0.001**	**0.011**	0.393	**0.008**	0.880	0.915	0.175		**< 0.001**
N	43	41	27	42	43	43	43	41	43	41
Video power index										
Pearson correlation	**0.492****	**0.746****	**0.481***	0.130	**0.393***	−0.021	−0.017	−0.202	**1.000****	1
Significance (2-tailed)	**0.001**	**< 0.001**	**0.011**	0.424	**0.011**	0.895	0.914	0.204	**< 0.001**	
N	41	41	27	40	41	41	41	41	41	41

GQS – global quality score; mDISCERN – modified DISCERN.
Note: * Correlation is significant < 0.05 level; ** Correlation is significant at the 0.01 level (2-tailed).

comprehensive information on HFS, contributing to their popularity. Conversely, content from independent users, health websites and news agencies generally saw mixed results in terms of engagement.

The exclusion of patient testimonials in this study was based on their tendency to promote commercial products or services rather than provide objective information (e. g., botulinum toxin clinic promotion, product advertisement) [11]. People generally remember stories more effectively as they are deemed more relatable than they do statistical information presented in graphs or numbers [11].

The overall performance of a video can be assessed through metrics

such as view count, likes, dislikes, and comments. Subscriber count plays a role in enhancing video performance metrics. For these parameters, while indicative of popularity, do not always correlate with information quality. For instance, the negative correlation between views and like ratios suggests that highly viewed videos may not always receive proportionally higher likes. Similarly, the positive correlations between views, likes, and comments highlight the interactive nature of popular videos but do not guarantee their accuracy or usefulness. The strong correlation between mDISCERN and GQS scores reinforces the importance of using established quality measures to assess health information on YouTube.

A noteworthy aspect of our study is the relationship between video duration and information quality, significant correlations were found between duration time and mDISCERN ($r = 0.342$, $p = 0.026$) and GQS scores ($r = 0.319$, $p = 0.040$), implying that longer videos may offer more comprehensive or higher-quality information. This aligns with the idea that extended video formats provide creators with more time to cover essential aspects of HFS, such as pathophysiology, symptoms, diagnosis, and treatment options.

This study underscores the need for careful evaluation of YouTube videos as health information sources. Patients and caregivers should be cautious about relying solely on engagement metrics as the indicators of video quality and reliability. Our analysis revealed that videos produced by healthcare professionals generally demonstrated a significantly higher quality compared to those created by non-experts. Furthermore, longer videos tend to include more comprehensible and actionable content.

This study has several limitations. First, YouTube search results are dynamic, with new content continuously being uploaded and existing videos being removed or re-ranked. As a result, the findings reflect the reliability and quality of videos at a particular moment in time. Second, the use of a restricted set of search terms, while chosen for their accessibility and relevance to lay audiences, may have excluded videos using more clinical or multilingual terminology. Third, while this study assessed video quality using the mDISCERN and GQS tools, these measures do not directly evaluate the reliability of content based on established medical guidelines or peer-reviewed research. Incorporating additional credibility assessments, or cross-referencing content with authoritative medical guidelines, would strengthen future studies.

5. Conclusions

Our findings indicated that while YouTube offers valuable resources for HFS patients, discerning viewers musty critically assess video content. Healthcare professionals and academic institutions have a pivotal roles in creating and promoting high-quality educational content. Accurate information from these videos can enhance understanding of the condition's pathophysiology and treatment options, and can complement the knowledge provided by healthcare professionals. Future efforts should focus on increasing the availability of reliable, expert-verified videos to improve overall quality of information accessible to patients.

Consent for publication

Not applicable as the manuscript does not contain any data from any individual person.

Authors' contributions

KLP and AJRS were responsible for data collection and writing the original draft. RDGJ was responsible for the conceptualization and reviewed, supervised, and edited the manuscript. All authors reviewed the manuscript.

CRediT authorship contribution statement

Kimberly L. Po: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation. **Alfeo Julius R. Sy:** Writing – review & editing, Writing – original draft, Formal analysis, Data curation. **Roland Dominic G. Jamora:** Writing – review & editing, Supervision, Methodology, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The datasets used and/ or analyzed during the current study are available from the corresponding author on reasonable request.

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