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YouTube as a Source of Information on Oropharyngeal Dysphagia Exercises: A Quality and Reliability Analysis

Orofaringeal Disfaji Egzersizleri Hakkında Bilgi Kaynağı Olarak YouTube: Bir Kalite ve Güvenilirlik Analizi

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ABSTRACT Objective: Dysphagia exercises are a cornerstone and have a very important place in oropharyngeal dysphagia rehabilitation. In this study, we investigated the reliability and quality of dysphagia exercise videos on YouTube. **Material and Methods:** In this cross-sectional study, videos were sorted by relevance by searching the YouTube platform with the keywords "dysphagia exercises," "dysphagia rehabilitation," "dysphagia physical therapy," and "dysphagia physiotherapy," and 50 videos out of 200 were evaluated. Video parameters have been recorded. The Journal of the American Medical Association (JAMA) criteria, the Modified Quality Criteria for Consumer Health Information (mDISCERN) scale, and the Global Quality Scale (GQS) were used to assess reliability and quality. Low, medium, and high-quality groups were created according to the GQS score. **Results:** Of the videos, 28% (n=14) were of low quality, 22% (n=11) were of medium quality, and 50% (n=25) were of high quality. Of the physician-uploaded videos, 100% (n=5) were of high quality. No significant differences in video parameters were found between the quality groups or between the sources. High-quality videos had significantly higher JAMA and mDISCERN scores than low-quality videos (p<0.001). The mDISCERN score for physicians was significantly higher than that for the website group (p<0.001). **Conclusion:** YouTube is a high-quality video source for dysphagia exercises. All videos shared by clinicians are of high quality, and high-quality videos are more reliable. Healthcare professionals should educate patients using YouTube about the importance of video sources and direct them to a reliable source.

Keywords: Oropharyngeal dysphagia; exercise; social media; YouTube

ÖZET Amaç: Orofaringeal disfajinin rehabilitasyonunda disfaji egzersizleri temel taşlardan biri olup, çok önemli bir yere sahiptir. Bu çalışma ile YouTube'daki disfaji egzersizleri videolarının güvenirliğini ve kalitesini araştırmayı amaçladık. **Gereç ve Yöntemler:** Bu kesitsel çalışmada, YouTube platformunda "dysphagia exercises", "dysphagia rehabilitation", "dysphagia physical therapy" and "dysphagia physiotherapy" anahtar kelimeleri ile arama yapılarak videolar alaka düzeyine göre sıralandı ve 200 video içinden 50 video değerlendirildi. Video parametreleri kaydedildi. Güvenirlik ve kalite değerlendirmeleri için Journal of the American Medical Association (JAMA) kriterleri, Modifiye Tüketici Sağlığı Bilgileri İçin Kalite Kriterleri [Modified Quality Criteria for Consumer Health Information (mDISCERN)] ölçeği ve Global Kalite Skalası (GKS) kullanıldı. GKS skoruna göre düşük, orta ve yüksek kalite grupları oluşturuldu. **Bulgular:** Videoların %28'inin (n=14) düşük, %22'sinin (n=11) orta ve %50'sinin (n=25) yüksek kaliteli olduğu saptandı. Hekimler tarafından yüklenen videoların %100'ü (n=5) yüksek kaliteliydi. Video parametreleri açısından kalite grupları arasında ve kaynaklar arasında anlamlı farklılık saptanmadı. Yüksek kaliteli videolar düşük kaliteli videolardan anlamlı olarak daha yüksek JAMA ve mDISCERN skoruna sahipti (p<0,001). Hekimler için mDISCERN skoru, web sitesi grubundan anlamlı olarak yüksekti (p<0,001). **Sonuç:** YouTube, disfaji egzersizleri için yüksek kaliteli bir video kaynağıdır. Hekimlerin paylaştığı tüm videolar yüksek kalitelidir ve yüksek kaliteli videolar daha güvenilirdir. Sağlık çalışanları, YouTube'u kullanan hastalarını video kaynaklarının önemi konusunda bilgilendirmeli ve güvenilir kaynağa yönlendirmelidir.

Anahtar Kelimeler: Orofaringeal disfaji; egzersiz; sosyal medya; YouTube

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Dysphagia is defined as difficulty in swallowing and can be caused by several diseases or problems.[1] Dysphagia is divided into two main classes: oropharyngeal and esophageal. Oropharyngeal dysphagia is a common type of dysphagia that refers to a disorder in the oral preparation and, oral and/or pharyngeal swallowing phases. Esophageal dysphagia, on the other hand, represents any problem in the process of passing food through the upper esophagus. Underlying causes of oropharyngeal dysphagia include stroke, neuromuscular disease, traumatic brain injury, head and neck surgery and/or radiation therapy, cervical spinal cord injury, rheumatologic disease, chronic obstructive pulmonary disease, and sarcopenia.[2] Oropharyngeal dysphagia is an important disorder that affects the safety, well-being, and quality of life of patients and can be life-threatening.[3] The most common complications of oropharyngeal dysphagia include malnutrition, dehydration, aspiration pneumonia, and death. Therefore, the treatment of dysphagia has a very important place in the field of rehabilitation. Several methods have been reported to treat or improve the symptoms of oropharyngeal dysphagia. Oropharyngeal exercises, commonly known as dysphagia exercises, are widely used to improve dysphagia symptoms, and their effectiveness has been demonstrated in many studies.[4-6] The internet has become an increasingly popular tool for obtaining health information, especially in the last 20 years.[7] According to the results of the Household Information Technology Use Survey, 94.1% of households will have access to the internet from home in 2022. It has been reported that 80% of internet users use social media platforms to obtain information about their diseases.[8] In particular, patients with chronic diseases increasingly rely on social media platforms to manage their diseases.[9] YouTube (https://www.youtube.com/; Google, Mountain View, California), a popular video-sharing website, is widely used worldwide to allow users to share and watch videos.[10] Because of its free video content and comprehensive nature, YouTube can be considered an effective tool for obtaining and disseminating health-related information. Therefore, it can also be used as an effective tool for patient education. If we look at the ranking of access to health-related information, the Internet represents a significant proportion with 34.9%, second only to health professionals.[11]

However, there are some concerns regarding the content and quality of the videos. The quality of information, content, and accuracy of uploaded videos should be carefully assessed, especially given the nature of YouTube, where anyone can upload videos without verification and they can be used for advertising purposes. Among health seekers, 86% are concerned about the reliability of information available online, and 44% believe that only some of this information is accurate.[12] However, patients, healthcare providers, and government agencies have expressed concerns regarding the accuracy and quality of information available on this platform.[12,13] Accordingly, videos on YouTube may contain inadequate or inaccurate information because they are not subject to an evaluation process and are not regularly updated. As a result, the risk of YouTube videos providing misleading health information and the credibility of the video may be questioned.[14,15]

The purpose of this study was to evaluate the quality, reliability, and accuracy of the most viewed English YouTube videos on oropharyngeal dysphagia exercises.

MATERIAL AND METHODS

On September 25, 2023, a search was conducted on YouTube (https://www.youtube.com/) using the keywords “dysphagia exercises,” “dysphagia rehabilitation,” “dysphagia physical therapy,” and “dysphagia physiotherapy.” The keywords used to search for videos were created by reviewing previous studies on exercise and YouTube.[16,17] To minimize the effect of previous internet use on search results, browser search history was cleared before the start of the study. The “video” and “sort by relevance” options were selected as filters. A total of 200 videos were obtained. Although there are studies that examine all videos, many studies have evaluated the first 50 most viewed videos.[18] Similarly, we evaluated the first 50 most viewed videos for 200 videos according to 4 keywords. Non-English videos, irrelevant videos, videos with sound or image quality problems, and repetitive videos were excluded from the study. We also excluded videos categorized as “short,” which were limited to one minute in length. Video content that was not in the “short” category, but was less than

one minute in length was, included in the study because of the lack of a time limit. All videos were analyzed by two researchers according to the inclusion/exclusion criteria. Of the remaining videos, the 50 most viewed videos were analyzed. The analysis was conducted by considering whether the posts contained non-health elements and information. If there was a difference between the scores of two researchers, the researchers re-evaluated the video together and made the final decision.

ETHICS COMMITTEE

This descriptive study was conducted by reviewing publicly available videos on the internet and did not involve human participants or animals. Therefore, ethics committee approval was not obtained as with similar studies in the literature.

VIDEO PARAMETERS

We recorded the duration of the video (seconds), time since upload (days), number of views, number of likes, number of views/days since upload, number of comments, and the source of the video. Because YouTube has removed the number of dislikes, the number of dislikes is not included in the analysis. Video sources were categorized as physicians, non-physician healthcare professionals, academic institutions, and websites.[17]

ASSESSING THE RELIABILITY AND QUALITY OF VIDEOS

The Modified Quality Criteria for Consumer Health Information (mDISCERN), Global Quality Scale (GQS), and Journal of the American Medical Association (JAMA) benchmark criteria were used to determine whether the information in the videos would be helpful to viewers and whether this information was reliable and provided better education to patients.

The JAMA criteria analyze the reliability and accuracy of videos using four criteria: authorship, references, patent rights, and currency.[19] For the items, a score of "0" indicates that the relevant criterion is not met, and a score of "1" indicates that the relevant criterion is met. The item scores are summed to produce a total score ranging from 0 to 4. Higher scores indicate higher reliability and accuracy.

mDISCERN scale is a 5-item questionnaire that determines the reliability of videos.[20] Scoring is done by assigning "1" point for each "yes" item and "0" point for each "no" item. The scores of the 5 items are summed to obtain a total score ranging from 0 to 5, with higher scores indicating greater reliability. The mDISCERN scale includes 5 questions with yes/no answers. "Yes" answers receive a score of one and "no" answers receive a score of zero, so the highest score is five and the lowest score is zero. This scoring system evaluates the objectivity, reliability, and understandability of the video with respect to the sources.

The quality of the videos was assessed using the GQS, which consists of 5 items. The total score ranges from 1 to 5. A total score of ≤2 is defined as "low quality," 3 points as "medium quality," and ≥4 points as "high quality."[21] This scoring system measures the quality of information obtained from the internet. The highest score of five indicates that the quality of the video is high and contains clear information, whereas the lowest score of one indicates that the quality of the video is very low and most of the information is missing.

STATISTICAL ANALYSES

All statistical analyses were performed using IBM SPSS for Windows version 20.0 (IBM Corp., Armonk, NY, USA). The Kolmogorov-Smirnov and Shapiro-Wilk's tests were used to assess the normality assumption. Continuous variables are presented with median (interquartile range) because the normality assumption did not hold. Categorical variables were summarized as counts and percentages. Comparison between groups was carried out using the Kruskal-Wallis test. The Dunn's test was used for multiple comparisons. Association between two categorical variables was examined using the chi-square test. A p-value<0.05 was considered statistically significant.

RESULTS

A total of 50 videos that met the established criteria were selected for further analysis. An overview of the included videos is shown in Table 1. Most of the videos were shared by non-physician healthcare professionals (n=20, 40%). Ten percent (n=5) of the videos were uploaded by physicians. The median

mDISCERN score was 3 and the median JAMA score was 3. According to the GQS score, 25 (50%) of the evaluated videos were of high quality, 11 (22%) were of medium quality, and 14 (28%) were of low quality. Of the high quality videos, 20% (n=5) were uploaded by physicians, 44% (n=11) by non-physician healthcare professionals, 16% (n=4) by academic/university sources, and 20% (n=5) by health-related websites. All physician uploaded videos were found to be of high-quality (Table 2).

When the parameters of the videos were compared between the high, medium, and low-quality groups, no significant difference was found in terms of duration, number of views, time since upload, number of likes, number of comments, and view rate ($p>0.05$). However, there was a significant difference in the mDISCERN and JAMA scores between the groups ($p<0.001$) (Table 2).

In post hoc analysis, there was no significant difference in the JAMA score between the high- and medium-quality groups, but it was significantly higher than that in the low-quality group. The mDISCERN score was significantly higher in the high-quality group than in the low- and medium-quality groups (Table 2).

When the video characteristics were compared according to the sources, there was a significant difference between the sources in terms of mDISCERN scores ($p=0.024$) (Table 3). Post hoc analysis revealed that the mDISCERN score of physician uploaded videos was significantly higher than that of the website uploaded videos. No significant difference was found between any of the video parameters (Table 3).

TABLE 1: General features of the videos

Parameters	Median (IQR)
Video duration (second)	377 (208.25-576.5)
Number of views	29446 (9966.5-79092)
Days since upload	888 (455-1899.25)
Number of likes	993.5 (71.75-1500)
Number of comments	27.5 (7.75-85)
View ratio (views/d)	47.04 (8.51-104.38)
JAMA score	3 (2-4)
mDISCERN score	3 (3-4)
GQS score	3.5 (2-4)
Sources of the videos, n (%)	
Physician	5 (10)
Non-physician health personel	20 (40)
Academic	12 (24)
Web sites	13 (26)
GQS	
Low	14 (28)
Medium	11 (22)
High	25 (50)

IQR: Interquartile range; JAMA: Journal of the American Medical Association; mDISCERN: Modified DISCERN; GQS: Global Quality Scale.

TABLE 2: Comparison of video sources and features according to quality classification

	GQS score, median (IQR)			
Parameters	**Low**	**Medium**	**High**	**p***
Video duration (second)	402 (180.75-658)	369 (162-555)	366 (247.5-555)	0.787
Number of views	34018 (5840.75-82814)	16000 (8844-81728.5)	32000 (13728-81728.5)	0.636
Days since upload	669 (358-2157)	1839 (422-1262.5)	863 (518.5-1262.5)	0.500
Number of likes	589 (38.75-1553)	122 (54-1551)	1105 (83.5-1551)	0.425
Number of comments	16 (4-90.5)	11 (5-87.5)	53 (14-87.5)	0.073
View ratio (views/d)	72.01 (6.08-107.39)	12.85 (6.84-111.83)	49.23 (9.44-111.83)	0.263
JAMA score	2 (1-2)[a]	3 (2-4)[b]	4 (3-4)[b]	**<0.001**
mDISCERN score	2 (1.75-2.25)[a]	3 (3-4.5)[a]	4 (4-4.5)[b]	**<0.001**
Sources of the videos, n (%)				NA
Physician	0 (0)	0 (0)	5 (20)	
Non-physician health personel	6 (42.9)	3 (27.3)	11 (44)	
Academic	3 (21.4)	5 (45.5)	4 (16)	
Web sites	5 (35.7)	3 (27.3)	5 (20)	

Different letters indicate statistically different groups. Bold p values indicate statistically significant differences. *Kruskal-Wallis test; NA: Not applicable (chi-square test not applicable); GQS: Global Quality Scale; IQR: Interquartile range; JAMA: Journal of the American Medical Association; mDISCERN: Modified DISCERN.

TABLE 3: Comparison of video features and quality by source.

	Physician median (IQR)	Non-physician health personel median (IQR)	Academic median (IQR)	Web sites median (IQR)	p*
Video duration (second)	555 (390.5-697.5)	389 (259.5-678.25)	308.5 (186.5-565.25)	366 (194-427.5)	0.313
Number of views	45698 (19439-89566.5)	19111 (7300-80219.25)	44507 (15250-96049.25)	30236 (8660.5-49944)	0.389
Days since upload	863 (527-1262.5)	828 (362.5-1775)	1412 (481.25-2370.25)	950 (606.5-1888)	0.765
Number of likes	1220 (617.5-1700)	422.5 (55.25-1551.5)	921 (88.25-1650)	999 (57.5-1237)	0.738
Number of comments	59 (25.5-143.5)	26.5 (10.25-89.5)	18.5 (7.25-77)	30 (4-74)	0.491
JAMA score	4 (3-4)	3 (2-3)	3 (2-4)	3 (1.5-3.5)	0.226
mDISCERN score	4 (4-5)[a]	3.5 (3-4)[ab]	3 (2.25-4)[ab]	3 (2-3.5)[b]	**0.024**
GQS score	4 (4-4.5)	4 (2-4)	3 (2.25-4)	3 (1.5-4)	0.132
View ratio (views/d)	66.32 (36.36-93.74)	19.32 (8.85-127.53)	51.81 (17.26-92.28)	44.84 (4.78-93.26)	0.606

Different letters indicate statistically different groups; Bold p values indicate statistically significant differences; *Kruskal-Wallis test; IQR: Interquartile range; JAMA: Journal of the American Medical Association; mDISCERN: Modified DISCERN; GQS: Global Quality Scale.

DISCUSSION

YouTube, one of the most popular video-sharing websites, has many videos on the diagnosis, treatment, etiopathogenesis, and prevention of various diseases. YouTube provides free video content to its users, but it lacks mechanisms to control the quality and accuracy of the videos. In addition, anyone with a YouTube account can upload videos. This can lead to the spread of poor quality, inaccurate, or biased information. Therefore, there is a need to analyze the reliability and quality of videos uploaded to YouTube on specific medical topics.

In studies analyzing YouTube videos related to various diseases, researchers have reported varying proportions of low, medium, and high-quality videos. Similar to the results of this study, there are studies showing that most videos are of high quality, as well as studies showing that most videos are of low quality.[10,12,13,22,23] There may be many reasons for the different results on the quality of YouTube videos. Methodological differences, such as studies of different diseases, differences in the number of videos analyzed, and the use of different scoring methods, may explain these differences. The results of this study suggest that the YouTube platform should be considered as a mixed pool of low, medium and high-quality videos.[24]

In this study, according to the GQS classification, 28% (n=14) of the videos were of low quality, 22% (n=11) were of medium quality, and 50% (n=25) were of high quality. In a study that analyzed YouTube videos on dysphagia exercises and compensatory maneuvers, 9.8% (n=5) of the videos were of low quality, 35.3% (n=18) were of medium quality, and 54.9% (n=28) were of high quality. Our results showed that the proportion of high-quality videos was similar. According to the results of this study, YouTube videos on oropharyngeal dysphagia exercises are of relatively high quality. Perhaps dysphagia is an area in which users are less knowledgeable and are therefore unable to upload videos on this topic.[25]

The majority of dysphagia exercise YouTube videos were uploaded by non-physician healthcare professionals and websites. Speech-language pathologists were the most non-physician healthcare professionals who produced video content. Videos uploaded by physicians accounted for 10% of the videos analyzed, suggesting that dysphagia management is a less well-known topic among physicians. Similarly, in a previous dysphagia exercise study, most YouTube videos were uploaded by non-physician healthcare professionals and academic institutions.[25] Therefore, a benefit of this study may be to bring this issue to the attention of physical medicine and rehabilitation physicians in particular. Physical medicine and rehabilitation physicians should be encouraged to become more involved in this rapidly evolving field.

Our study demonstrated the importance of sources when using YouTube as a source of health-related information. When the quality of the videos was assessed by source, the primary sources of the highest quality videos were physicians and non-physician health professionals. All videos uploaded by physicians were of high quality (n=5, 100%). Medium- and low-quality videos were sourced from non-physician healthcare professionals, academic institutions, and websites. Consistent with our findings, none of the videos uploaded by physicians in previous studies were of low-quality.[10,17,25] In general, videos uploaded by healthcare professionals are expected to have a lower rate of misinformation because they are produced by people with a certain level of medical knowledge.

When the parameters of the videos were compared between the high, medium, and low- quality groups, no significant difference was found in terms of duration, number of views, time since upload, number of likes, number of comments, and view rate ($p>0.05$). However, there was a significant difference in the mDISCERN and JAMA scores between the groups ($p<0.001$). In post hoc analysis, there was no significant difference in the JAMA score between the high- and medium-quality groups, but it was significantly higher than that in the low-quality group. For the mDISCERN score, the high-quality group was significantly higher than the low- and medium-quality groups. According to these results, videos with high reliability were also of medium or high quality. Similar to the previous study on dysphagia exercises on YouTube, when the parameters of the videos were compared between the high, medium and low-quality groups, no significant difference was found in the number of daily views, likes, and comments ($p>0.05$). There was a significant difference in the DISCERN scores between the groups ($p<0.001$). In a post hoc analysis, DISCERN scores between low and medium quality and between low and high quality showed significant differences, and high quality videos were found to have high reliability ($p<0.05$).[25] Our results are similar.

The number of views is the most important indicator of the popularity of YouTube videos. People who watch videos on YouTube can click the "Like" or "Dislike" button and comment below the videos according to their ratings. However, this study found no significant relationship between the quality of videos and the number of views, likes, and comments. Similarly, other studies reported that there was no significant difference in the rate of video views according to the video quality levels.[10,13,24,26] Our results show that duration, number of views, time since upload, number of likes, number of comments, number of daily likes, number of daily comments, and video view rate are not indicators of video quality and reliability. Therefore, we believe that the most prominent parameters, such as the number of views, do not reflect video quality and patients, should be cautious in this regard. This can make it difficult for internet users to choose better quality and more reliable videos.

This study has several limitations. YouTube videos were evaluated in a single snapshot. However, YouTube is dynamic, and new videos are added, commented on, and viewed over time, which can change search results. Second, only English-language YouTube videos were searched. Because only English videos were sampled, it is difficult to generalize the results to all populations. In addition, YouTube logarithms are affected by cookies, geolocation, and other sources. Therefore, our YouTube search results may not be consistent for everyone.

CONCLUSION

We found that the oropharyngeal dysphagia exercise videos evaluated on the YouTube platform were of high quality and reliable. Physicians with the potential to produce high-quality videos should be encouraged to create more videos. Healthcare professionals should educate their patients who use YouTube about the importance of video resources. Universities, academics, healthcare professionals, and associations should be encouraged to produce videos that provide accurate, consistent, and high-quality medical information. Including videos in languages other than English in studies examining the recommended exercise types will add new perspectives to the literature.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

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