Original paper

YouTube videos as an information source about exercises for temporomandibular disorders

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Abstract

Background. Temporomandibular disorders (TMD) are musculoskeletal and/or neuromuscular conditions that affect the muscles, joints and associated structures of the stomatognathic system.

Objectives. This study aimed to evaluate the quality and reliability of publicly available English-language videos on YouTube about TMD exercises, and to examine the video sources and professional groups responsible for the creation of the videos.

Material and methods. The quality and reliability of the YouTube videos related to TMD exercises were evaluated using the DISCERN score, the global quality scale (GQS) and the JAMA (Journal of the American Medical Association) score.

Results. Of the 121 videos evaluated, 30 (24.8%) were uploaded by professional organizations, 49 (40.5%) by health information websites, and 42 (34.7%) were uploaded by independent users. Professional organizations had a significantly higher number of subscribers, likes, comments, and views than healthcare webpages and independent users ($p < 0.001$). The duration of videos uploaded by independent users was significantly longer than that of videos uploaded by healthcare webpages ($p = 0.018$). With regard to the profession of the video narrators, the unspecified group exhibited significantly lower JAMA ($p < 0.001$), GQS ($p = 0.011$) and DISCERN scores ($p = 0.002$) compared to chiropractors, physiotherapists, physicians, and other healthcare professionals. The JAMA scores for physicians, personal trainers and chiropractors were significantly lower than those for other healthcare professionals ($p < 001$). The JAMA score was positively correlated with the GQS ($r = 0.469$, $p < 0.001$) and DISCERN ($r = 0.505$, $p < 0.001$) scores. Similarly, the DISCERN score was positively correlated with the GQS score ($r = 0.924$, $p < 0.001$).

Conclusions. Despite the abundance of video content on YouTube about TMD exercises, the quality of these videos is low, and their reliability is questionable.

Keywords: YouTube, Internet, temporomandibular disorders, health education, exercises

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Introduction

The American Academy of Orofacial Pain (AAOP) defines temporomandibular disorders (TMD) as an umbrella term encompassing the temporomandibular joint, masticatory muscles and related structures.[1] Temporomandibular disorder is the most common musculoskeletal disorder following back pain.[2] The symptoms may include pain in the masticatory muscles or jaw joint, as well as headaches in the temple area.[3] Studies have shown that TMD affect 7–15% of the global population, and the National Institutes of Health (NIH) states that the highest incidence of TMD occurs between the ages of 18 and 43.[4,5] Biomechanical, psychosocial, neurobiological, and neuromuscular factors play a role in the development of TMD.[6] Additionally, trauma, bruxism, hypermobility of the joint, and stress are potentially contributing to their etiology.[6]

Physiotherapy is one of the first interventions used in the management of pain in individuals with TMD. Physiotherapists should address issues such as pain in the masticatory muscles and joints, functional limitations in the temporomandibular joint, and cervical spine dysfunction in individuals with TMD.[7] The most commonly used methods of treating patients with TMD are manual therapy and dry needling.[8] The term "manual therapy" involves numerous applications, including joint mobilization and manipulation, as well as soft tissue interventions such as stretching or trigger point therapy.[9] When orofacial pain is caused by cervical region dysfunction, interventions for the cervical spine should be incorporated into the treatment plan.[10] Two meta-analyses demonstrated the efficacy of manual therapy and exercises for TMD pain symptoms, but there was no consensus on which approach is more effective.[11,12]

The Internet has become an important source of information on health-related topics.[13] Social media platforms such as YouTube, Facebook, Instagram, and Twitter have become an environment for users to obtain information about specific subjects and to share their experiences. YouTube is the most popular video-sharing platform in the world, enabling users to upload and watch videos.[14] The platform boasts over 2 billion users and reaches billions of views.[15] It is an effective tool for obtaining and disseminating health-related information, offering a variety of videos at no cost. In addition, YouTube functions as an educational instrument for both patients and healthcare professionals.[16]

The content of YouTube videos on health-related topics ranges from basic health education to the latest medical treatments.[16] Videos about health problems are becoming increasingly popular, but concerns have been raised about the quality and reliability of videos intended for patient education.[17] In particular, the accuracy of information and the content of the uploaded videos must be verified because there is no quality filter in terms of content accuracy, and these videos can be used for advertising purposes.[18] Since YouTube may have such disadvantages, it may do more harm than good for patients.[19]

In the literature, there are studies that assess the quality and reliability of YouTube videos on a variety of topics, including the rehabilitation of lymphedema,[20] ankylosing spondylitis,[18] fibromyalgia,[21] and piriformis syndrome.[19] However, there is currently no study that evaluates YouTube videos about TMD exercises. In this respect, this study will represent a novel contribution to the existing literature. The primary objective of the study was to evaluate the quality and reliability of publicly available English-language videos on TMD exercises. The second aim was to examine the properties of the videos in terms of the identity of the publishers.

Material and methods

Search strategy

This descriptive study was conducted on July 16, 2022, using the YouTube webpage (https://www.youtube.com). As in previous studies,[21–23] the YouTube search history was entirely deleted prior to the commencement of the study. The researchers selected 4 keywords to identify the videos to be included in the study. These keywords were "TMJ disorder and exercises", "Temporomandibular joint dysfunction and exercises", "Temporomandibular joint syndrome and exercises", and "TMD and exercises". Approximately the first 100 English-language videos for each of these keywords were included, as most users typically view the first few pages of search results.[24] Subsequently, the selected videos were saved to a playlist in the YouTube library for further analysis. A total of 410 videos were watched and evaluated. Similar to previous studies,[21,25] videos in a language other than English, off-topic videos, music videos, videos with no audio or visual content, duplicate videos, and videos longer than 30 min were excluded from the analysis. Finally, 121 videos were selected for inclusion in the study, which were assessed independently by 2 physiotherapists. A flowchart of the screening and selection process of the videos is shown in Fig. 1. All observers participated in a standard training session and received identical instructions regarding the pre-study questionnaires and the scoring criteria. The remaining videos were then viewed and evaluated independently, after which they were combined and their scores were compared. In case of any inconsistency between the physiotherapists' assessments, they re-discussed and re-evaluated the videos in order to reach a consensus. In the event that consensus could not be reached, a third physiotherapist was consulted for a final evaluation.

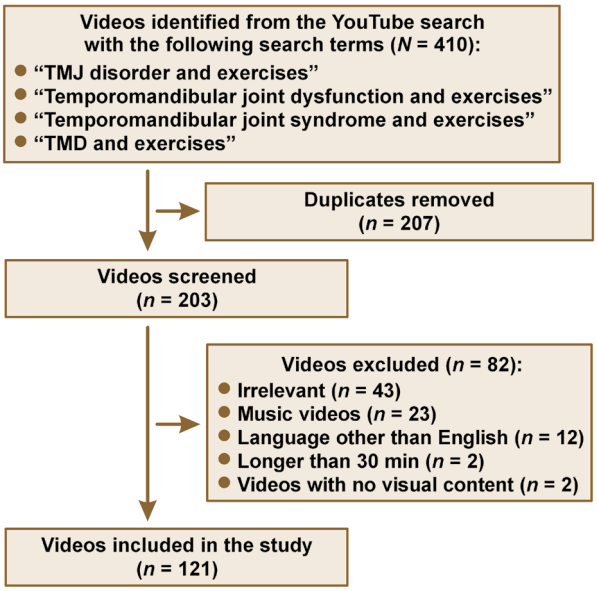

Fig. 1. Flowchart of the screening and selection process

TMJ – temporomandibular joint; TMD – temporomandibular disorders.

Video parameters

The video parameters subjected to analysis included the video upload date, the publisher's subscriber count, the number of likes, the number of comments, the duration of the video (min), the total number of views, and the average number of views per day. The mean daily view count was calculated by dividing the total number of views and comments by the total number of days the video was available on YouTube.[26] All of these parameters were recorded for each video.

Video sources

The sources of the video were classified into 4 categories: professional organizations; health information websites; independent users; and other sources.

Profession of the narrator

The profession of the narrator in the video was classified into 7 categories: physician; physiotherapist; chiropractor; other healthcare professional; personal trainer; and unspecified.

Type of exercise

The type of exercise depicted in the video was classified into the following categories: static stabilization exercises; dynamic stabilization exercises; stretching exercises; joint mobilization; joint manipulation; myofascial release; deep friction massage; trigger point release; posture exercises; TMJ rotation exercises; occipital lift; massage therapy; jaw exercises; and tongue exercises.

Evaluation of quality and reliability

In this study, the global quality scale (GQS) and the JAMA (Journal of the American Medical Association) score were used to assess the quality of the videos.[27–29] The GQS is a tool developed by Bernard et al.[30] The GQS questionnaire has been partially modified to align with the subject matter. The score for each item on the questionnaire ranges from 1 to 5. The survey evaluates the usefulness, flow and quality of the videos, in which a score of 4 or 5 points indicates excellent quality, a score of 3 indicates medium quality, and a score of 1 or 2 indicates low quality. The GQS scoring system used in the present study is outlined below:

– videos with 1 point are of poor quality, exhibiting deficiencies in flow and information content. Therefore, they are not useful for patients with TMD. The exercises depicted in these videos are not suitable for the treatment of TMD;
– videos with 2 points are usually of poor quality. Although they include some exercises, they contain limited information for patients with TMD. While some of the exercises are suitable for the treatment of TMD, the majority are not. The videos contain some useful information, but they also include a considerable amount of misinformation;
– videos with 3 points are of moderate quality. In these videos, the demonstration of some exercises is accurate, whereas the presentation of other exercises is incorrect. The content is a combination of useful and potentially misleading information for patients. However, the videos do not contain a significant amount of misleading information;
– videos with 4 points are of good quality, with a satisfactory flow. They contain useful exercises for patients with TMD. The vast majority of exercises are presented correctly. The videos exhibit only minor flaws and are suitable for patients with TMD;
– videos with 5 points are of superior quality and have excellent flow. They contain very useful exercises for the treatment of TMD patients. All exercises are explained accurately. The number of repetitions and the duration of the exercises are specified in detail. They are an accurate exercise guide for patients with TMD.

Another survey used to determine the quality of videos is the JAMA score. The JAMA score evaluates 4 criteria related to the quality of videos: authorship; description; attribution; and validity. If a criterion is met, 1 point is awarded. A maximum of 4 points can be awarded, with a total of 4 indicating a video of good quality.[31]

Finally, the DISCERN tool, developed by Charnock et al., was used to evaluate the reliability of the videos.[32] The DISCERN tool has previously been used in similar YouTube studies.[21] It consists of 16 questions and an overall quality rating. It is divided into 3 sections. The first part comprises 8 questions and assesses the reliability of the video in

quesiton. The second part consists of 7 questions and evaluates the quality of the information provided regarding treatment options. The third part consists of a single question, which is used to evaluate the overall quality of the information provided, and to assign an overall rating. Each question is assigned a score between 1 and 5. If a criterion is fully met, the highest score is awarded. Conversely, if a criterion is not met at all, it is assigned the lowest score.[32] Detailed information, examples and instructions for each question are described in the DISCERN handbook.[33] The total score is calculated by adding the scores of the first 15 questions.[34] Any score between 63 and 75 points indicates perfect results, between 51 and 62 points indicates good results, between 39 and 50 points indicates intermediate results, between 27 and 38 points indicates poor results, and a score of 27 points or less is indicative of very poor results.[35,36] The DISCERN tool is presented in Table 1.

Ethics statement

The study did not involve the use of human or animal subjects. It exclusively examined publicly accessible videos. Accordingly, ethical approval was not required for this study. A similar approach has been taken in previous YouTube studies.[37–39]

Statistical analysis

The statistical analysis was performed using the IBM SPSS Statistics for Windows software, v. 25.0 (IBM Corp., Armonk, USA). The normality of the distribution was evaluated through the application of the Kolmogorov–Smirnov and Shapiro–Wilk tests. Continuous variables are presented as median (interquartile range) (*M* (*IQR*)), while categorical variables are given as number and percentage (*n* (%)). The Mann–Whitney *U* test was used for comparisons between 2 groups, in accordance with the results of the normality tests. In cases where there were more than 2 groups, the Kruskal–Wallis test was utilized. The relationships between JAMA, DISCERN and GQS scores were assessed by Spearman's correlation analysis. A p-value <0.05 was considered statistically significant.

Results

Of the 410 videos analyzed, 121 were included in the study. The general features of the included videos, such as the video duration, the number of likes, comments and views, as well as the distribution of video sources are given in Table 2. Of the 121 videos evaluated, 30 (24.8%) were uploaded by professional organizations, 42 (34.7%) by independent users, and 49 (40.5%) by health information websites. The results revealed a statistically significant difference between groups in terms of the number of subscribers ($p < 0.001$), likes ($p < 0.001$), comments ($p < 0.001$), views ($p < 0.001$), views per day ($p < 0.001$), and video duration ($p = 0.028$) according to the video source. In the pairwise comparisons of professional organizations versus healthcare webpages and professional organizations versus independent users, the number of subscribers, likes, comments, and views was found to be significantly higher for professional organizations than for healthcare webpages and independent users ($p < 0.001$). The videos uploaded by independent users had a significantly longer duration than those uploaded

Table 1. DISCERN reliability tool

Section	Question number	Question	Score range
Section 1	1	Are the aims clear?	1–5
	2	Does it achieve its aims?	1–5
	3	Is it relevant?	1–5
	4	Is it clear what sources of information were used to compile the publication (other than the author or producer)?	1–5
	5	Is it clear when the information used or reported in the publication was produced?	1–5
	6	Is it balanced and unbiased?	1–5
	7	Does it provide details of additional sources of support and information?	1–5
	8	Does it refer to areas of uncertainty?	1–5
Section 2	9	Does it describe how each treatment works?	1–5
	10	Does it describe the benefits of each treatment?	1–5
	11	Does it describe the risks of each treatment?	1–5
	12	Does it describe what would happen if no treatment is used?	1–5
	13	Does it describe how the treatment choices affect overall quality of life?	1–5
	14	Is it clear that there may be more than 1 possible treatment choice?	1–5
	15	Does it provide support for shared decision-making?	1–5
Section 3	16	Based on the answers to all of these questions, rate the overall quality of the publication as a source of information about treatment choices	1–5

Table 2. Characteristics of the analyzed videos according to their source

Variable	Professional organizations (*n* = 30) *M* (*IQR*)	Health information websites (*n* = 49) *M* (*IQR*)	Independent users (*n* = 42) *M* (*IQR*)	*p*-value	*p*-value		
					professional organizations vs health information websites	professional organizations vs independent users	health information websites vs independent users
Time since upload [months]	46 (30–59)	30 (16–48)	24 (17–40)	0.084	0.266	0.200	0.266
Subscribers, *n*	1,760,000 (178,000–4,270,000)	7,740 (706–28,800)	13,800 (1,530–111,000)	<0.001*	<0.001**	<0.001**	0.094
Likes, *n*	2,600 (1,200–8,400)	75 (13–255)	130 (41–893)	<0.001*	<0.001**	<0.001**	0.085
Comments, *n*	179 (68–565)	9 (2–23)	12 (2–146)	<0.001*	<0.001**	<0.001**	0.202
Video duration [s]	365 (250–535)	260 (104–454)	345 (231–685)	0.028*	0.033**	0.805	0.018**
Views, *n*	95,723 (34,592–513,486)	4,389 (1,049–17,269)	6,754 (2,193–44,391)	<0.001*	<0.001**	<0.001**	0.248
Views per day, *n*	130 (52–325)	5 (2–26)	6 (3–75)	<0.001*	<0.001**	<0.001**	0.160
JAMA	3 (2–3)	2 (2–3)	3 (2–3)	0.491	0.235	0.393	0.758
GQS	3 (2–4)	2 (2–3)	3 (2–4)	0.198	0.169	0.931	0.101
DISCERN	38 (30–50)	34 (29–43)	41 (30–51)	0.276	0.448	0.606	0.102

* statistically significant ($p < 0.05$, Kruskal–Wallis test (comparison of the groups)); ** statistically significant ($p < 0.05$, Mann–Whitney *U* test (pairwise comparison of the groups)); *M* – mean; *IQR* – interquartile range; JAMA – Journal of the American Medical Association score; GQS – global quality scale.

by health information websites ($p = 0.018$). Additionally, professional organizations had a significantly longer video duration than healthcare webpages ($p = 0.033$).

The basic characteristics of the videos, according to the profession of the narrator, are given in Table 3. Significant differences were observed in video duration and the JAMA, GQS and DISCERN scores between the professions ($p < 0.05$). The unspecified group had significantly lower JAMA ($p < 0.001$), GQS ($p = 0.011$) and DISCERN ($p = 0.002$) scores compared to chiropractors, physiotherapists, physicians, and other healthcare professionals. Additionally, the JAMA scores of the physicians, personal trainers and chiropractors were significantly lower than those of the other healthcare professionals ($p < 0.001$). The mean video duration of personal trainers was significantly higher than that of chiropractors, physiotherapists and other healthcare professionals ($p = 0.025$).

A review of the video content revealed that massage therapy, static stabilization exercises and jaw exercises were the most prevalent, in descending order. The contents of the analyzed videos are presented in Table 4.

The JAMA score was positively correlated with the GQS and DISCERN scores ($r = 0.469$ and $r = 0.505$, respectively; $p < 0.01$). A positive correlation was observed between the DISCERN score and the GQS score ($r = 0.924$, $p < 0.01$). A comparison of the JAMA, GQS and DISCERN scores is given in Table 5.

Discussion

The aim of this study was to evaluate the quality and reliability of YouTube videos about exercises used in the treatment of temporomandibular joint dysfunction. The results of this study indicate that there was no significant difference in the JAMA, GQS and DISCERN scores according to the video sources. However, a significant difference was found in the JAMA, GQS and DISCERN scores in relation to the profession of the video narrator ($p < 0.05$). A significant difference was observed in the basic features of the videos, including the number of subscribers, likes and comments, as well as the duration of the videos, according to the video sources. However, only a significant difference in video duration was noted between the profession groups.

Many scoring systems can be used to evaluate the quality and reliability of video content.[40,41] One of the main reasons for using the JAMA, DISCERN and GQS scores in the analysis of YouTube videos is that these scores have been previously applied in other studies, thereby facilitating comparisons across different analyses. In our study, a positive correlation was identified between the JAMA, GQS and DISCERN scores. Similar results have been documented in the literature.[42,43] Video content related to numerous conditions, including

Table 3. Characteristics of the analyzed videos according to the profession of the narrator

Variable	Physician (*n* = 16) *M* (*IQR*)	Physiotherapist (*n* = 45) *M* (*IQR*)	Chiropractor (*n* = 23) *M* (*IQR*)	Other healthcare professional (*n* = 16) *M* (*IQR*)	Personal trainer (*n* = 7) *M* (*IQR*)	Unspecified (*n* = 14) *M* (*IQR*)	*p*-value
Video upload date	39 (24–59)	31 (22–58)	23 (15–46)	24 (17–38)	27 (10–36)	24.5 (13–67)	0.313
Subscribers, *n*	229,000 (11,150–5,010,000)	14,000 (776–154,000)	54,300 (1,680–150,000)	11,250 (1,520–15,350)	81,700 (1,350–205,000)	20,250 (381–69,200)	0.096
Likes, *n*	660 (69–3,100)	189 (44–1,100)	506 (43–6,300)	86 (38–910)	418 (135–1,200)	85.5 (31–228)	0.347
Comments, *n*	73 (7–216)	18 (3–85)	25 (2–663)	23 (4–147)	68 (21–112)	5 (2–16)	0.099
Video duration [s]	348 (250–515)	348 (153–535)	461 (174–759)	250 (145–322)	857 (330–1,294)	269 (125–426)	0.025*
Views, *n*	37,506 (4,607–116,622)	6,754 (1,974–63,453)	17,269 (2,053–286,940)	4,884 (1,656–49,256)	15,094 (4,245–35,398)	7,058 (2,577–15,942)	0.603
Views per day, *n*	31 (3–113)	8 (3–64)	13 (4–400)	19 (2–63)	59 (13–137)	8 (3–18)	0.292
JAMA	2 (2–3)	3 (2–3)	2 (2–3)	3 (3–3)	2 (2–3)	1 (1–2)	<0.001*
GQS	3 (2–4)	3 (2–4)	3 (2–4)	3 (2–4)	2 (2–3)	2 (1–2)	0.011*
DISCERN	38 (32–45)	39 (32–50)	40 (28–51)	42 (30–52)	36 (31–43)	26.5 (22–30)	0.002*

* statistically significant ($p < 0.05$, Kruskal–Wallis test (comparison of the groups)).

Table 4. Exercises included in the analyzed YouTube videos (*N* = 121)

Exercise type	Included	Not included
Static stabilization exercises	37 (30.6)	84 (69.4)
Dynamic stabilization exercises	28 (23.1)	93 (76.9)
Stretching exercises	31 (25.6)	90 (74.4)
Joint mobilization	8 (6.6)	113 (93.4)
Joint manipulation	3 (2.5)	118 (97.5)
Myofascial release	7 (5.8)	114 (94.2)
Deep friction massage	5 (4.1)	116 (95.9)
Trigger point release	16 (13.2)	105 (86.8)
Posture exercises	35 (28.9)	86 (71.1)
TMJ rotation exercises	30 (24.8)	91 (75.2)
Occipital lift	5 (4.1)	116 (95.9)
Massage therapy	53 (43.8)	68 (56.2)
Jaw exercises	36 (29.8)	85 (70.2)
Tongue exercises	9 (7.4)	112 (92.6)

Data presented as frequency (percentage) (*n* (%)); TMJ – temporomandibular joint.

Table 5. Comparison of the JAMA (Journal of the American Medical Association), global quality scale (GQS) and DISCERN scores

Score	Spearman's rho	
	GQS	DISCERN
JAMA	0.469*	0.505*
GQS	1.000	0.924*
DISCERN	0.924*	1.000

* statistically significant ($p < 0.01$, Spearman's correlation analysis).

shoulder instability, fibromyalgia, hallux valgus, TMD, and neck pain, has been analyzed in terms of quality and reliability.[21,25,43–45] These studies have revealed that the quality of video content is low and that its reliability is often poor. As social media continue to play an increasingly prominent role in our lives, particularly with the advancement of new technologies, the potential for the dissemination of misinformation is likely to accelerate. It is important that video content producers take measures to prevent the dissemination of misinformation by subjecting the information to rigorous screening.

A comparative analysis revealed that professional organizations had a significantly higher number of views than the other 2 groups. This shows that the videos uploaded by professional organizations attract more attention. YouTube studies have shown that healthcare webpages on osteoporosis and the side effects of biologic therapy have a higher number of views than the videos of professional organizations and independent users on the subject.[23,46] In this study, while the number of subscribers, likes and comments was significantly higher in professional organizations than in the other groups, no significant differences were found between independent users and professional organizations in terms of video duration. It can be posited that the reason for the higher number of subscribers, likes and comments associated with professional organizations is reflected in the interaction between the video and the audience, which is influenced by the number of views. In addition, professional organizations possess the necessary equipment for filming. The incorporation of a variety of enhancements in their videos may attract the attention of the audience.

The results of our study indicated no significant differences in the JAMA, DISCERN and GQS scores based on the video sources. On the contrary, in previous similar studies, the scale scores of professional organizations and health service webpages have exceeded those of individual users.[29,46] Given that the majority of patients do not verify the sources, they may be exposed to videos of low quality and reliability. In this regard, the literature underscores the importance of professional organizations increasing the quantity of their video content.[22]

One of the main results of our study was that the unspecified group of narrators uploaded videos of lower quality and reliability when compared to the videos of chiropractors, physiotherapists, physicians, and other healthcare professionals. Similarly, Ertem et al. found that videos created by independent users for the treatment of piriformis syndrome were less reliable than those created by healthcare professionals and physicians.[19] It is widely accepted that high scores for the DISCERN and GQS indicate high reliability and quality.[23,47] In addition, our study revealed that the reliability of videos created by physicians, personal trainers and chiropractors was lower than that of videos created by other healthcare professionals. Our results indicate that videos uploaded to YouTube may lack reliability, even when uploaded by physicians. It may be difficult for physicians to determine the specific triggers for TMD, given the multifaceted nature of the underlying causes.[48] It is recommended that physicians thoroughly review the current guidelines before creating video content on this topic.[14,49]

Upon examination of the video content included in the study, it was determined that massage therapy, static stabilization exercises and jaw exercises were the most prevalent. Physiotherapy techniques such as active and passive stretching, postural exercises, strengthening of related muscles, and manual therapy are effective in the treatment of TMD.[50] Medlicott and Harris stated that a treatment program consisting of active exercises, manual therapy and relaxation techniques is the most effective treatment method for TMD.[51] Calixtre et al. found that manual therapy and stabilization exercises for the upper cervical spine increased the pain threshold and maximum mouth opening in patients with TMD.[50] Despite the prevalence of stabilization exercises in the videos examined in our study, the number of manual therapy approaches, such as mobilization and manipulation, was limited, which may have resulted in a reduction in the reliability of the videos.

Limitations

The present study had some limitations. Firstly, only English-language videos were included in the study, which restricted the generalizability of the results. As the present study did not review videos in languages other than English, the information and experiences derived from these languages are not available. Given that English is the most widely used language globally,[52] we believe that this limitation does not significantly impact the validity of the study findings. It should not be overlooked that the order in which the videos appear may vary depending on the IP address and the location from which they are searched. This may have introduced a potential minor bias. In addition, the YouTube videos were evaluated at a single point in time. However, it should be noted that YouTube has a dynamic structure, and new videos may be added, potentially influencing the results. It is also possible that the number of views and comments on the videos may change over time.

Conclusions

The results of the research indicated that the quality and reliability of the videos were low when analyzed according to the source of the video and the profession groups. Despite the rapid growth of YouTube, the platform often fails to provide accurate information for patients. It is important for patients to be aware that the control mechanisms designed to ensure the accuracy of information on YouTube are insufficient, and that the information they contain may be incorrect. Therefore, patients should not base their decisions on the content of videos related to the subject, as the information presented in YouTube videos may have a detrimental impact on patients' health. To prevent the potential for adverse effects resulting from inappropriate use, it is recommended that YouTube videos be used only for the purpose of obtaining guidance from qualified medical professionals, such as physicians.

Ethics approval and consent to participate

Not applicable.

Data availability

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

Consent for publication

Not applicable.

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