

YouTube as an information resource for early orthodontic treatment with clear aligners

Derya Dursun¹, Rumeysa Bilici Geçer¹, Sanaz Sadry²

¹ University of Health Sciences, Hamidiye Faculty of Dentistry, Department of Orthodontics, İstanbul, Türkiye

² İstanbul Atlas University, Faculty of Dentistry, Department of Orthodontics, İstanbul, Türkiye

Received: 27 May 2024

Accepted: 5 August 2024

Correspondence:

Dr. Derya DURSUN

University of Health Sciences,
Hamidiye Faculty of Dentistry,
Department of Orthodontics,
İstanbul, Türkiye

E-mail: derya.dursun@sbu.edu.tr



How to cite this article:

Dursun D, Bilici Geçer R, Sadry S. YouTube as an information resource for early orthodontic treatment with clear aligners. Int Dent Res. 2024;14(3):114-121.
<https://doi.org/10.5577/intdentres.519>

Abstract

Aim: The aim of this study is to evaluate the content, reliability, and quality of videos about early orthodontic treatment with clear aligners on YouTube.

Methodology: Using the most frequently employed search terms—"Invisalign First" and "aligner for kids"—the authors searched YouTube for relevant videos and recorded the number of views, likes, comments, video duration, and days since uploading. An 11-point content score was employed to identify low- and high-quality videos, and the global quality scale (GQS) was used to examine the quality of the videos. This study adopted a modified version of the DISCERN tool for evaluating the reliability of health and medical information and used the Mann-Whitney U test to compare the video groups with high- and low-quality content. A p -value of <0.05 was deemed statistically significant.

Results: A content analysis classified 26% of the YouTube videos as high-quality content and 74% as low-quality content. The most frequent topics in the videos were descriptions of the appliance (66%) and the types and mechanism of the appliance (51%), whereas the least mentioned topics were the cost of treatment (13%), the disadvantages of the appliance (5%), and comparisons of treatment options (15%). The quality of the videos was evaluated as moderate in 36% of the 61 videos, poor or generally poor in 28%, and good or excellent in 36%. The mean reliability score (2.49 ± 1.29) indicates that the videos' reliability was generally poor. The high-quality content group had a greater mean video length, viewing rate, and GQS and reliability score than the low-quality content group. A statistically significant positive correlation was identified between content score, GQS, and reliability score values ($p < 0.05$).

Conclusion: YouTube video content relating to early orthodontic treatment with clear aligners was generally inadequate. The quality of the videos was moderate, but the reliability score indicated that they were not generally reliable. Orthodontists should be aware of the inadequacies of YouTube recordings and ensure that patients have access to accurate and reliable recordings.

Keywords: YouTube, early orthodontic treatment, clear aligners, DISCERN, global quality scale

Introduction

Early orthodontic treatments prevent or correct orthodontic anomalies during the deciduous and mixed dentition period or reduce the severity of future treatment (1). As with all fields of dentistry, orthodontics recognizes the importance of aesthetic treatment. The demand for orthodontic treatment across all age groups has resulted in a need for treatments that are both aesthetically pleasing and comfortable (2). Accordingly, the clear aligner has become widely used in the early treatment of children.

With the latest advances in digital technology for orthodontic treatment, presented the Invisalign First System (Align Technology, Tempe, AZ, USA), a clear aligner system for Phase I treatment (crossbite, deep bite, crowding, and diastema) of patients aged 6-10 years (3). At the end of Phase 1, orthodontic treatment can be recontinued with a new treatment (Phase 2) for a maximum of three years (4). The Invisalign clear aligner system has been used to treat more than 14 million patients worldwide, mostly adults and teenagers (5). Clear aligners, which have recently been employed as a new treatment option in children, present a difficulty for patients and parents. Patients and parents often turn to visual content providers such as YouTube to understand the different three-dimensional designs and uses of clear aligners (2). Therefore, information about the use of clear aligners as an early treatment option for children is important.

Today, a considerable proportion of the global population has access to a multitude of websites and social media platforms that offer health-related information. Consequently, many individuals seek to meet their health information needs through the Internet (2, 6). YouTube is a social media platform that was established in 2005 where any account holder can upload and share videos (7). Patients prefer YouTube over other social media platforms because it provides visual and audio information (8). YouTube receives more than 1.9 billion visits every month and offers services in multiple languages, reaching 95% of the Internet population (6). In particular, parents use websites and social media platforms to learn about health problems related to their children (9). While YouTube can be a useful resource for individuals, it can also contain misleading information (10). The quality of this easily accessible information can have an impact on patients and, indirectly, on the treatment process recommended by physicians. The objective of this study was to assess videos uploaded to YouTube on the use of clear aligners in early orthodontic treatment for children.

Materials and Methods

The Google Trends application was employed to identify the most prevalent search terms associated with “aligners for kids” (Google Trends 2020, Alphabet, USA).

In the present study, the frequently searched terms “Invisalign first,” “Invisalign kids,” “aligner for kids,” and “Invisalign for children” were set as the keywords. The search parameters were set as follows: “past 5 years,” “worldwide,” and “YouTube search.” A YouTube search using these keywords was conducted on November 28, 2023. The search filter was set to the default “sort by relevance.” In the literature, it is reported that 90% of search engine users only viewed the first three pages of search results (6). Similarly, a study was conducted on 100 videos, the majority of which were located on the first three pages. The videos’ unique source locators (URLs) were recorded. Videos were excluded if they lacked audio, exceeded 15 minutes in length, were duplicates, or were neither in English nor relevant to the subject matter. After watching the videos with the exclusion criteria in consideration, a total of 61 videos were evaluated. For each video, the following identifying characteristics were recorded: the number of views, likes, and comments, the length of the video in seconds, the number of days since the video was uploaded, and the view rate.

The viewing rate is measured by taking the number of views, dividing it by the number of days since the video was posted, and then multiplying that number by 100 (2, 6, 11). Video sources were classified into four groups: (i) dentists or orthodontists, (ii) dental clinics or universities, (iii) patients or laypersons, and (iv) dental companies or commercial entities.

The content of the YouTube videos related to the use of clear aligners in children included in the study was evaluated by two experienced orthodontists (R.B.G and D.D). There is no standardized scoring system for the video content rating method, so the video content was evaluated using modified scoring criteria from previous studies (2, 6). Each video was scored based on these parameters, and the video’s “total content score” was calculated on a scale of 1 to 11. The total content score was employed to categorize the videos. Those with a score of 6 or above were identified as high-quality content, while those with a score of 5 or below were considered low-quality content (Table 1).

A modified form of the validated DISCERN health and medical information quality tool was used to assess reliability (6). The survey consisted of 5 questions. For each question, the response of “no” was assigned a score of 0 points, while the response of “yes” was assigned a score of 1 point. The total of these points was employed in the calculation of a “reliability score” (Fig. 1). In addition, the global quality scale (GQS), a 5-point scale, was employed to assess the quality of the videos (11) (Fig. 1).

Statistical analysis

Analyses were performed by using NCSS (Number Cruncher Statistical System) software (NCSS, LLC, East Kaysville, Utah, USA).

The quantitative data were described using the mean, standard deviation (SD), median and interquartile

range (IQR). The Shapiro-Wilk test was employed to verify the normality of distribution. The Mann-Whitney U test was employed to compare paired groups of variables that did not follow a normal distribution, while the

Pearson correlation test was utilized to investigate the relationship between the variables. The results were subjected to a statistical evaluation at the level of significance $p < 0.05$.

Modified DISCERN Scale /Reliability Score	Total score (5 points)
1. Are the aims clear?	0 or 1 point
2. Are reliable sources of information used? (publication cited, speaker is an orthodontist)	0 or 1 point
3. Is the information presented balanced and unbiased?	0 or 1 point
4. Are additional sources of information listed for patient reference?	0 or 1 point
5. Are areas of uncertainty mentioned?	0 or 1 point
Global Quality Scale / Quality Score	Score
Poor quality, poor flow of the video, most information missing, not helpful for patients	Score 1
Generally poor quality and poor flow, some information listed but many important topics with limited use to patients	Score 2
Moderate quality, suboptimal flow, some important information is adequately discussed, but other information is poorly discussed, so somewhat useful for patients	Score 3
Good quality, generally good flow, most relevant information is covered, is useful for patients	Score 4
Excellent quality and flow, very useful for patients	Score 5

Figure 1. Contents Modified DISCERN Scale and Global Quality Scale

Table 1. Evaluation of information content of videos

Contents Score	
Definition of appliance	Description of early orthodontic treatment with clear aligners
Importance of treatment	Does it mention the importance of early treatment with clear aligners in children?
Period of application	Does it mention the optimal age range for treatment?
Application procedure	Does it mention the instructions for use of the appliance?
Benefits	Does it mention the benefits of treatment with clear aligners at an early stage?
Comparison of treatment options	Are the differences between clear aligner treatments and removable appliances mentioned?
Types and mechanism	Does it describe the types and mechanism of early orthodontic treatment with clear aligners?
Disadvantage	Are there any disadvantages of early orthodontic treatment with clear aligners?
Discussing factors	Have factors such as psychological effects and allergies related to the use of clear aligners by children been discussed?
Treatment time	Is the treatment time and process of early orthodontic treatment with clear aligners mentioned?
Cost	Does it mention the cost?

Results

The values related to the video data are shown in Table 2. The mean total number of video views was 4039.34. The mean number of likes was 28.70, the mean number of comments was 1.42, the mean video length (second) was 170.91, and the mean days since upload (in days) was 827.34. The mean viewing rate was 386.48. The mean GQS score was 3.14, the mean reliability score was 2.49, and the mean content score was 3.81.

According to video sources, 46% of the videos were uploaded by dental clinic/university, 39% by dental company/commercial, 8% by layperson/patients and 7% by dentist/orthodontist. Regarding the reliability score, most videos lacked additional sources of information for patient reference (75%), and areas of uncertainty were not typically mentioned (84%). Conversely, in most videos, the stated aims were clearly achieved (69%), the information presented was balanced and unbiased (56%) and used reliable sources (speaker is an orthodontist) of information (69%).

The GQS results indicate that 36% of the videos exhibited moderate quality, 28% were of poor or generally poor quality, and 36% were of good or excellent quality. In terms of content quality, 16 videos were classified as high-quality content and 45 as low-quality content. A comparison of the variables between low- and high-quality content videos is presented in Table 3.

The high-quality content group had higher mean video length and viewing rate than the low-quality content group ($p<0.05$). However, here was no statistically significant difference between the low and high content groups regarding the number of views, likes, comments, and the number of days since the upload ($p>0.05$). Compared with the low-quality content group, the high-quality content group had a significantly higher GQS and reliability score ($p<0.05$). In terms of content score, the most frequently mentioned topics in the videos were the description of the appliance (66%) and the types and mechanism of the appliance (51%), while the least mentioned topics were the cost of treatment (13%), the disadvantages of the appliance (5%) and the comparison of treatment options (15%) (Fig. 2).

Table 4 presents the correlation matrix, which depicts the Pearson correlation coefficients between content score, GQS reliability score, and video characteristics scores.

A statistically significant positive correlation was found between content score values and video duration, GQS Score, and reliability score values ($r=0.494$ $p=0.0001$, $r=0.591$ $p=0.000$, $r=0.643$ $p=0.0001$, respectively). There was a statistically significant positive correlation between GQS scores and reliability scores ($r=0.643$, $p=0.0001$). Additionally, a statistically significant positive correlation was found between reliability scores and video duration ($r=0.336$, $p=0.008$).

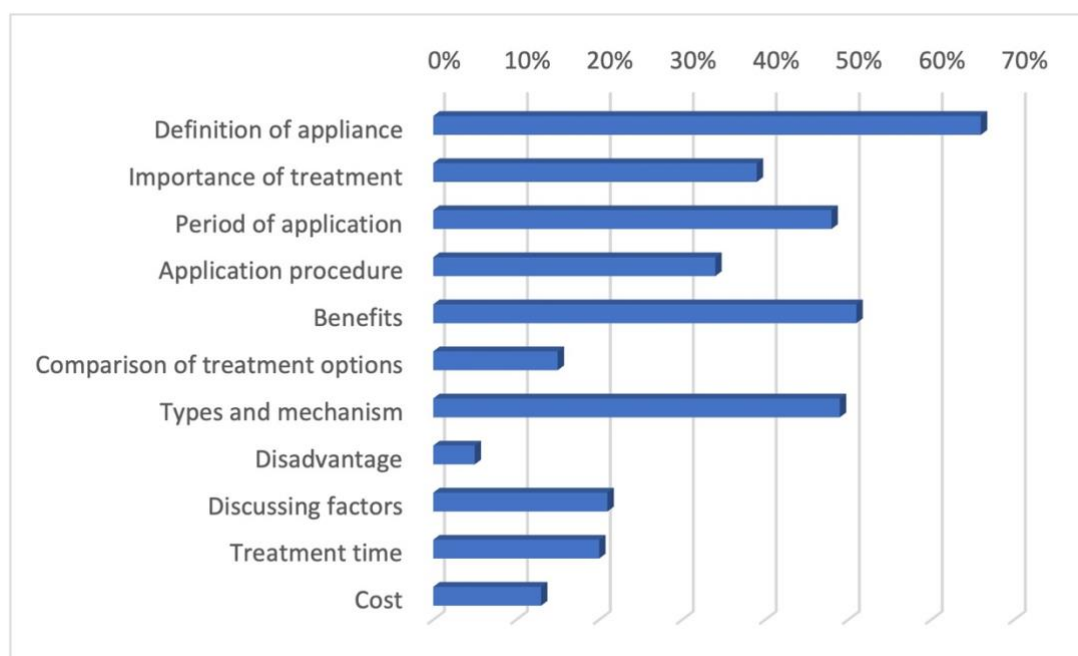


Figure 2. Distribution of information content in YouTube videos about early orthodontic treatment with clear aligners

Table 2. Descriptive statistics of evaluated videos

Variables	Minimum	Maximum	Median	Mean ± SD
Video characteristics				
No. of views	10	133000	390	4039.34± 17366.87
No. of likes	0	646	2	28.70 ± 108.85
No. of comments	0	58	0	1.42 ± 7.56
Video length (in seconds)	28	604	127	170.91 ± 137.43
Days since upload (in days)	10	2190	730	827.34 ± 553.45
View rate	15	2027.39	71.36	386.48 ± 1218.83
GQS*	1	5	3	3.14 ± 1.10
Reliability score	0	5	2	2.49 ± 1.29
Content score	1	10	3	3.81± 2.23

* GQS: Global Quality Scale

Table 3. Evaluation of videos according to low and high information content

Variables	Low-quality content (n=45)		High quality content (n=16)		p-value
	Mean ± SD	Median (IQR)	Mean ± SD	Median (IQR)	
No. of views	4956.27±20171.7	288 (69.5-961)	1460.5±1802.32	709 (150.75-2800)	0.211
No. of likes	36.93±125.96	2 (0-7.5)	5.56±9.37	1 (0-5.5)	0.352
No. of comments	1.84±8.77	0 (0-0)	0.25±1	0 (0-0)	0.441
Video length (second)	133.2±103.54	93 (66,5-159)	277±166,84	281.5 (136-394.5)	0.001‡
Days since upload (in days)	875.56±542,8	730 (365-1095)	691.75±578.3	547.5 (293.7-1003)	0.233
Viewing rate	412.07±1399.91	42.36 (16.6-216.4)	314.52±431.48	224.56 (56.6-334.3)	0.04‡
GQS*	2.84±1.02	3 (2-4)	4.00±0.89	4 (3-5)	0.0001‡
Reliability score	2.09±1.2	2 (1-3)	3.63±0.81	4 (3-4)	0.0001‡

* GQS: global quality scale, Mann-Whitney U test, p<0.05‡

Table 4. Correlation analysis

		Content score	GQS	Reliability score
No. of views	r	-0.111	0.027	-0.120
	p	0.394	0.837	0.358
No. of likes	r	-0.159	0.012	-0.079
	p	0.220	0.930	0.544
No. of comments	r	-0.116	0.022	-0.110
	p	0.373	0.865	0.399
Video length (second)	r	0.494	0.242	0.336
	p	0.0001	0.06	0.008
Days since upload (in days)	r	-0.068	0.029	0.083
	p	0.604	0.826	0.527
Viewing rate	r	-0.077	0.043	-0.098
	p	0.555	0.745	0.453
GQS	r	0.591	1	0.643
	p	0.0001		0.0001
Reliability score	r	0.643	0.643	1
	p	0.0001	0.0001	
Content score	r	1	0.591	0.643
	p		0.0001	0.0001

GQS indicates global quality scale.

Discussion

Internet resources have become an important source of public health information for patients and parents particularly on health issues (12). The advent of technology has led to the internet becoming a primary source of information on a wide range of health-related topics. Indeed, 81% of the population now uses the internet for health-related research (2). Numerous studies have reported that YouTube is a commonly used source of health information for parents of pediatric patients (12, 13). Nevertheless, the ease of video sharing through the ability of anyone to upload videos and the lack of control over the content of uploaded videos raises questions about the validity of the information on YouTube (2). Several studies have been conducted to evaluate the content of YouTube videos on health issues in the fields of dentistry and medicine (10, 14, 15). The topics investigated include pediatric dental trauma, early childhood caries, oral hygiene in children, and early orthodontic treatment (1, 16-18). Furthermore, there are studies that evaluate YouTube videos of orthodontic treatment with clear aligners, which are widely used in orthodontics today (2, 6, 19). However, to the best of our knowledge, no research has been conducted to assess the quality and content of YouTube videos on the use of clear aligners in early orthodontic treatment of children. In the study, GQS and DISCERN scoring used in previous studies were used to evaluate the quality and reliability of YouTube videos (11, 14).

The mean Global Quality Scale (GQS) score (3.14 ± 1.10) indicated that the videos in this study were of moderate quality. Conversely, the mean reliability score (2.49 ± 1.29) indicated that video reliability was generally poor. Ustdal et al. reported that the YouTube video content on aligner treatment is typically inadequate, and the reliability of the information is usually poor (6). In a recent study, Sadry et al. (2) concluded that YouTube videos were insufficient as a source of information about orthodontic treatment with clear aligners. The findings are consistent with the study reporting that the mean DISCERN scores of orthodontic information on YouTube and TikTok were 2.42 and 1.27, respectively (20). The poor reliability score is related to the fact that most videos generally do not provide additional sources of information for patients (75%) and do not mention areas of uncertainty (84%). According to the GQS results, 36% of the videos were of moderate quality, 28% were of poor or generally poor quality, and 36% were of good or excellent quality. Similarly, most studies have reported that the health-related content of YouTube videos is of low quality (21, 22). The video content quality is important, as it demonstrates that feedback on these videos significantly influences patients' decision-making processes regarding orthodontic treatment (23). Videos for pediatric patients on using clear aligners at an early age are enhanced with visuals and feature a smooth flow. This can increase

motivation to undergo treatment in children and patients of other ages.

Ozturk et al. reported that there is a higher number of low-quality videos about early orthodontic treatment on YouTube. (1). There were similar findings in our study, which found that 74% of YouTube videos were low quality, while only 26% were high quality. The videos rarely included information on disadvantages, costs, or a comparison of treatment options related to early orthodontic treatment using clear aligners. In another study of YouTube videos about clear aligners, the least mentioned topics were cost and comparison of treatment options (6). Accurate information is vitally important when patients and parents are deciding on methods of treatment to ensure a successful outcome. YouTube is a platform where anyone can create an account and upload videos. So, any inaccurate, inadequate, or unreliable information, especially about health-related issues, may affect the physician-patient relationship and pose a major challenge for physicians. In the literature, it has been stated that the duration of a video is an important criterion (24). As the duration of the video increases, it can provide more detailed information to the viewers. However, increasing the duration of the videos may lead to a loss of concentration on the subject (25). In the current study, the mean video duration and viewing rate of the high-quality content video group were higher. Similarly, Kaval et al. (24) evaluated YouTube videos for regenerative endodontic treatment procedures and reported a positive correlation between video duration and content score. Like previous research, the current study found that videos containing quality information were longer and had higher viewing rates (14, 15).

The GQS and reliability scores of the high-quality content video group were higher, and there was a positive correlation between GQS, reliability, and content score. The flow of information, the abundance of descriptive elements such as pictures and subtitles in the videos, visual narration, and reliable sources all increased the quality and reliability scores. This could provide an explanation for the relationship between the content score and the quality and reliability score. Similarly, Lena and Dindaroglu (26) observed a positive correlation between quality and content when they conducted an analysis of YouTube content related to lingual orthodontics.

Limitations

It should be noted that the study was subject to certain limitations. The responses were analyzed only in English, which precludes the possibility of generalizing the outcomes to include all languages. Furthermore, the YouTube platform is a continuously dynamic platform. It is possible that replacement videos get added to the platform or existing videos are removed. Consequently, the standardization of content control is rendered challenging.

Conclusion

The video content on YouTube relating to early orthodontic treatment with clear aligners was generally insufficient. The quality of the videos was moderate, although the reliability score indicated that this was not generally reliable. Patients and parents who want to use YouTube to learn about early orthodontic treatment with clear aligners may have difficulty finding videos with high-quality content. It is critical for healthcare professionals to identify videos with accurate and useful content on YouTube and direct patients to the right resources.

Disclosures

Peer-review: Externally peer-reviewed.

Author Contributions: Conception - D.D.; Design - D.D., R.B.G.; Supervision - R.B.G.; Materials - D.D., R.B.G.; Data Collection and/or Processing - D.D., R.B.G.; Analysis and/or Interpretation - D.D.; Literature Review - D.D., S.S.; Writer -D.D.; Critical Review - R.B.G., S.S.

Conflict of Interest: No conflict of interest was declared by the authors.

Funding: There is no any funding.

References

- Ozturk T, Gumus H. YouTube as an information and education source for early orthodontic treatment. *Am J Orthod Dentofacial Orthop.* 2022;162(3):e123-e32. <https://doi.org/10.1016/j.jado.2022.06.013>
- Sadry S, Buyukbasaran E. Content analysis and reliability of YouTubeTM videos on clear aligner. *Apos Trends Orthod.* 2021;11(3):209-17. https://doi.org/10.25259/APOS_46_2021
- Lione R, Cretella Lombardo E, Paoloni V, Meuli S, Pavoni C, Cozza P. Upper arch dimensional changes with clear aligners in the early mixed dentition : A prospective study. *J Orofac Orthop.* 2023;84(1):33-40. <https://doi.org/10.1007/s00056-021-00332-z>
- Pinho T, Rocha D, Ribeiro S, Monteiro F, Pascoal S, Azevedo R. Interceptive Treatment with Invisalign(R) First in Moderate and Severe Cases: A Case Series. *Children (Basel).* 2022;9(8):1176. <https://doi.org/10.3390/children9081176>
- Wang J, Bukhari A, Tai SK, Zou B. Dimensional changes in the palate associated with Invisalign First System: a pilot study. *Angle Orthod.* 2023;93(5):524-30. <https://doi.org/10.2319/110422-755.1>
- Ustdal G, Guney AU. YouTube as a source of information about orthodontic clear aligners. *Angle Orthod.* 2020;90(3):419-24. <https://doi.org/10.2319/072419-491.1>
- Yagci F. Evaluation of YouTube as an information source for denture care. *J Prosthet Dent.* 2023;129(4):623-9. <https://doi.org/10.1016/j.prosdent.2021.06.045>
- ElKarmi R, Hassona Y, Taimeh D, Scully C. YouTube as a source for parents' education on early childhood caries. *Int J Paediatr Dent.* 2017;27(6):437-43. <https://doi.org/10.1111/ipd.12277>
- Moon RY, Mathews A, Oden R, Carlin R. Mothers' Perceptions of the Internet and Social Media as Sources of Parenting and Health Information: Qualitative Study. *J Med Internet Res.* 2019;21(7). <https://doi.org/10.2196/14289>
- Hegarty E, Campbell C, Grammatopoulos E, DiBiase AT, Sherriff M, Cobourne MT. YouTube™ as an information resource for orthognathic surgery. *J Orthod.* 2017;44(2):90-6. <https://doi.org/10.1080/14653125.2017.1319010>
- Özkan TH, Dursun D. An assessment of the quality of information for patients on YouTube™ regarding orthodontic elastics. *Turkish Journal of Orthodontics.* 2022;35(3):192. <https://doi.org/10.5152/TurkJOrthod.2022.21132>
- Samur Erguven S, Topsakal KG, Aksoy M. YouTube™ as a source of parents' information for craniosynostosis. *Orthodontics & Craniofacial Research.* 2024; 27(Suppl. 1): 141-149. <https://doi.org/10.1111/ocr.12732>
- Çapan BŞ. YouTube as a source of information on space maintainers for parents and patients. *Plos one.* 2021;16(2):e0246431. <https://doi.org/10.1371/journal.pone.0246431>
- Simsek H, Buyuk SK, Çetinkaya E. YouTube™ as a source of information on oral habits. *Journal of Indian Society of Pedodontics and Preventive Dentistry.* 2020;38(2):115-8. https://doi.org/10.4103/JISPPD.JISPPD_357_19
- Korkmaz YN, Buyuk SK. YouTube as a patient-information source for cleft lip and palate. *The Cleft Palate-Craniofacial Journal.* 2020;57(3):327-32. <https://doi.org/10.1177/1055665619866349>
- Tozar KN, Yapıcı Yavuz G. Reliability of information on YouTube™ regarding pediatric dental trauma. *Dental traumatology.* 2021;37(6):772-8. <https://doi.org/10.1111/edt.12708>
- ElKarmi R, Hassona Y, Taimeh D, Scully C. YouTube as a source for parents' education on early childhood caries. *International journal of paediatric dentistry.* 2017;27(6):437-43. <https://doi.org/10.1111/ipd.12277>
- Duman C. YouTube™ quality as a source for parent education about the oral hygiene of children. *International journal of dental hygiene.* 2020;18(3):261-7. <https://doi.org/10.1111/idh.12445>
- Alpaydın MT, Buyuk SK, Baybek NC. Information on the Internet about clear aligner treatment-an assessment of content, quality, and readability. *Journal of Orofacial Orthopedics.* 2022;83(Suppl 1):1. <https://doi.org/10.1007/s00056-021-00331-0>
- Kılınc DD. Is the information about orthodontics on Youtube and TikTok reliable for the oral health of the public? A cross sectional comparative study. *Journal of Stomatology, Oral and Maxillofacial Surgery.* 2022;123(5):e349-e54. <https://doi.org/10.1016/j.jormas.2022.04.009>
- Singh AG, Singh S, Singh PP. YouTube for information on rheumatoid arthritis-a wakeup call? *The Journal of rheumatology.* 2012;39(5):899-903. <https://doi.org/10.3899/jrheum.111114>
- Erturk-Avunduk AT, Delikan E. Evaluation of the quality of YouTube™ videos about pit and fissure sealant

- applications. International Journal of Dental Hygiene. 2023;21(3):590-8. <https://doi.org/10.1111/idh.12646>
23. Buyuk SK, Alpaydin MT. Quality of Information on YouTube™ about Rapid Maxillary Expansion. Turk J Orthod. 2021;34(2):116-121. <https://doi.org/10.5152/TurkJOrthod.2021.20069>
24. Kaval ME, Demirci GK, Atesci AA, Sarsar F, Dindaroğlu F, Güneri P, Caliskan MK. YouTube™ as an information source for regenerative endodontic treatment procedures: Quality and content analysis. International journal of medical informatics. 2022;161:104732. <https://doi.org/10.1016/j.ijmedinf.2022.104732>
25. Delli K, Livas C, Vissink A, Spijkervet FK. Is YouTube useful as a source of information for Sjögren's syndrome? Oral diseases. 2016;22(3):196-201. <https://doi.org/10.1111/odi.12404>
26. Lena Y, Dindaroğlu F. Lingual orthodontic treatment: a YouTube™ video analysis. The Angle Orthodontist. 2018;88(2):208-14. <https://doi.org/10.2319/090717-602.1>