Czy anglojęzyczne filmy z serwisu YouTube są wiarygodnym źródłem informacji na temat ortodoncji u osób dorosłych?

Are English-language YouTube videos a reliable source for adult orthodontics?

Derviş Emre Ercan[1] A C F (ORCID ID: 0000-0003-4457-4439)
Mehmet Ali Yavan[2] B D (ORCID ID: 0000-0002-2162-060X)

Wkład autorów: A Plan badań B Zbieranie danych C Analiza statystyczna D Interpretacja danych E Redagowanie pracy F Wyszukiwanie piśmiennictwa

Authors' Contribution: A Study design B Data Collection C Statistical Analysis D Data Interpretation E Manuscript Preparation F Literature Search

[1] Zakład Ortodoncji, Uniwersytet Kapadokya, Turcja
 Department of Orthodontics, Kapadokya University, Turkey

[2] Zakład Ortodoncji, Wydział Stomatologii Uniwersytetu Adıyaman, Turcja
 Department of Orthodontics, Faculty of Dentistry Adıyaman University, Turkey

Streszczenie

Serwis YouTube dostarcza treści w wielu dziedzinach opieki zdrowotnej, także w ortodoncji. **Cel.** Celem tego badania była ocena wiarygodności, jakości i treści anglojęzycznych filmów z serwisu YouTube na temat ortodoncji u osób dorosłych. **Materiał i metody.** W serwisie YouTube przeprowadzono wyszukiwanie z zastosowaniem słów kluczowych, stosując dwa słowa kluczowe: „aparat ortodontyczny dla osób dorosłych" oraz „ortodoncja u osób dorosłych", które określono na podstawie statystyk Google Trends. Badano wyniki dotyczące treści, wiarygodności i ogólnej jakości (wskaźnik VIQI [ang. Video Information and Quality Index]), jak również wyniki indeksu interakcji i oglądalności filmów. **Wyniki.** Do analizy włączono łącznie 106 kwalifikujących się filmów spośród 150 filmów. Filmy zostały przesłane

Abstract

YouTube, provides content in the field of orthodontics, as in many areas of healthcare. **Aim.** This study aimed to evaluate the reliability, quality, and content of English-language YouTube videos on adult orthodontics. **Material and methods.** A key word search was conducted on YouTube using two key words including 'adult brace' and 'adult orthodontics' that were determined based on the Google Trends statistics. The content, reliability, and overall quality (Video Information and Quality Index [VIQI]) scores as well as the interaction index scores and viewing rates of the videos were investigated. **Results.** A total of 106 eligible videos out of 150 videos were included in the analysis. The videos were uploaded by three main groups including patients (53%), orthodontists (32%), and media organizations (15%).

Adres do korespondencji/*Correspondence address:*
Mehmet Ali Yavan
Orthodontics, Adıyaman University, Faculty of Dentistry, Turkey
e-mail: yavanmehmetali@gmail.com

Are English-language YouTube videos a reliable source for adult orthodontics?

przez trzy główne grupy, czyli pacjentów (53%), ortodontów (32%) i organizacje medialne (15%). Średnie wyniki dotyczące treści, wiarygodności i wskaźnika VIQI wynosiły odpowiednio 1,74∓1,48, 1,70∓1,47 oraz 9,00∓4,32. Wartości dla indeksu interakcji i oglądalności filmów zamieszczonych przez pacjentów były istotnie wyższe niż dla pozostałych dwóch grup, natomiast wyniki dotyczące ich treści, wiarygodność i wskaźnika VIQI były istotnie niższe (p>0,05). Nie stwierdzono istotnych różnic pomiędzy filmami zamieszczonymi przez ortodontów i organizacje medialne pod względem treści, wiarygodności i wskaźnika VIQI (p>0,05). **Wnioski.** Mimo że filmy zamieszczone przez pacjentów miały niższe wyniki dotyczące treści, jakości i wiarygodności, ich indeks interakcji i oglądalność były wyższe. **(Ercan DE, Yavan MA. Czy anglojęzyczne filmy z serwisu YouTube są wiarygodnym źródłem informacji na temat ortodoncji u osób dorosłych? Forum Ortod 2022; 18 (3): 144-51).**

The mean content, reliability, and VIQI scores were 1.74∓1.48, 1.70∓1.47, and 9.00∓4.32, respectively. The interaction index and viewing rates of the videos uploaded by the patients were significantly higher than those of other two groups, whereas their content, reliability, and VIQI scores were significantly lower (p<0.05). No significant difference was found between the videos uploaded by orthodontists and media organizations with regard to content, reliability, and VIQI scores (p>0.05). **Conclusions.** Although the videos uploaded by patients had lower content, quality, and reliability scores, their interaction index scores and viewing rates were higher. **(Ercan DE, Yavan MA. Are English-language YouTube videos a reliable source for adult orthodontics? Orthod Forum 2022; 18 (3): 144-51).**

Introduction

Orthodontic treatment can be easily applied to adults in line with their needs and depending on their intraoral conditions although it is a common belief that orthodontic treatment is specific to children and adolescents only (1,2). In addition, the interest of adults in orthodontic treatment has increased over the last several years (3). This interest primarily arises from the increasing awareness in orthodontic treatment, the advancements in orthodontic technology, and the positive effects of having a healthy dental alignment on other dental treatments (4-6).

Most common reason for the majority of adults seeking for orthodontic treatment is the desire to improve their dental and facial appearance (7) and other reasons may include psychosocial factors, maintaining dental and gingival health, obtaining better occlusal and functional relationships, and maintaining general health (7-9). Numerous studies have shown that adults often have greater self-confidence, better career opportunities, and an improved social life after orthodontic treatment (10-12). Conversely, there are several reasons that prevent adults from seeking for orthodontic treatment, including fear of pressure from their social environment, high treatment costs, long treatment periods, and fear of pain (12,13). On the other hand, as the age increases, periodontal problems, temporomandibular joint disorders, and tooth loss can be seen in adults and also growth modification treatments cannot be applied in such

patient groups due to the completion of growth and tissue maturation (2). Additionally, the plurality of personal variables and social and psychological factors related to adulthood may also require different orthodontic approaches in these individuals (6,9). For this reason, raising the awareness of adults about orthodontics is highly important.

Today, internet and social media are frequently utilized to reach information about the problems encountered in many areas including healthcare or to find a solution for these problems (14). The information obtained via these platforms can improve people's motivation for treatment (15). YouTube is the world's largest video sharing website that allows uploading, publishing, and viewing videos from any web browser through an average internet connection speed without requiring extensive technical expertise (16). Given that adults also use the internet and YouTube highly frequently to research about healthcare issues (17), investigation of the content and quality of the videos on healthcare issues is of paramount importance.

YouTube, provides content in the field of orthodontics, as in many areas of healthcare. The reliability and quality of these videos, which are not subjected to peer review, have been investigated by numerous studies (18-20). Of these, the study by Yavan and Gökçe (21) reported that the Turkish-language YouTube videos on adult orthodontics are high-quality and reliable and contain a moderate level of

information. Nevertheless, to our knowledge, there has been no study investigating the quality and reliability of English-language YouTube videos on adult orthodontic treatment. Therefore, the present study aimed to evaluate the reliability and quality of English-language YouTube videos on adult orthodontics.

Material and methods
No ethical approval was required since the study data were obtained from publicly accessible YouTube videos.

Research Strategy
Key words were determined using the Google Trends statistics (https://trends.google.com/trends), which indicated that 'adult brace' and 'adult orthodontics' were the most searched words related to adult orthodontics worldwide since 2004. Prior to key word search, all the search history in the computer was deleted in order to eliminate the possible effects of both the words previously searched by the users and the cookies left by previously visited websites on the search predictions. Subsequently, the search on YouTube was conducted using the two keywords in the "New Private Window" feature of Google Chrome on October 26, 2021 and the results and their URL addresses were recorded. Afterwards, the results were sorted by "relevance" and a total of 150 videos were obtained. Videos that were published in a language other than English, duplicates and no auditory or visual content, and those that were not related to adult orthodontics and contained an advertisement were excluded.

All the videos were reviewed and their characteristics including title, URL address, duration in minutes, number of views, number of likes and dislikes, number of comments, time since upload, number of subscribers of the corresponding YouTube channel, and uploader type (e.g. orthodontist, patient, and media organization) were recorded.

The interaction index and viewing rate of the videos were calculated using the following formulas (22):

Interaction index (%) = number of likes − number of dislikes / number of views × 100

Viewing rate (%) = number of views / number of days since upload × 100

The content quality of the videos was evaluated using the parameters proposed by Yavan and Gökçe (21). These parameters included (i) stating/mentioning no age limit for orthodontic treatment, (ii) indicating/mentioning that the malalignment of the jaws and positional problems of the teeth can be treated with traditional orthodontic treatments only during the growth and development period, (iii) indicating/mentioning that the malposition of the jaws in adults can be treated with orthognathic surgical methods, (iv) indicating/mentioning that the likelihood of periodontal problems and teeth extraction and restoration can

be seen with advancing age and thus the existing clinical condition should be evaluated with a careful examination prior to orthodontic treatment, (v) indicating/mentioning that there are novel and aesthetic treatment methods (ceramic braces, lingual braces, and clear aligners) in addition to metal braces, (vi) and stating/mentioning that the treatment plan in adults can be personalized according to patients' psychosocial factors. Videos were assigned a modified score of 1 for each parameter and then the total score was calculated for each video. Videos with a score of <2 were considered as videos with a poor content, 2-4 as videos with a moderate-level content, and ≥4 as videos with a rich content.

The reliability of the videos was assessed using an adapted version of the DISCERN questionnaire which included items such as 'Is the purpose of the video clear and has it been achieved?', 'Are the sources of information (e.g., information provided by an orthodontist, valid studies cited to support the claims) reliable?', Is the data provided by the video balanced and unbiased?', 'Are additional sources of information provided?', and 'Does the video contain Reference to areas of uncertainty?' (23,24).

Overall quality of the videos was rated using the Video Information and Quality Index (VIQI), which involves a 5-point Likert scale ranging from 1 (low quality) to 5 (high quality) and evaluates four parameters: (i) flow of information, (ii) information accuracy, (iii) quality (use of still images, use of animation, interview with individuals/patients, providing video description or summary), and (iv) precision (level of consistency between video title and video content) (25).

All the videos were re-evaluated by the same researcher (DEE) one month later and intra-rater reliability was calculated. Additionally, all the videos were also reviewed by a second researcher (MAY) to assess inter-rater reliability. Both researchers were trained in the implementation of both assessment tools (DISCERN, VIQI).

Statistical analysis
Data were analyzed using SPSS 22.0 for Windows (Armonk, NY: IBM Corp.). Descriptives were expressed as minimum, maximum, mean, median, and standard deviation (SD). Normal distribution of data was assessed using Shapiro-Wilk test. Groups were compared using One-Way ANOVA test and Kruskal Wallis test as appropriate. Correlations were determined using Spearman's Correlation Coefficient. Intra- and inter-class correlation coefficients were determined to measure intra- and inter-rater agreement for the content, reliability, and VIQI scores of the videos. A p value of <0.05 was considered significant.

Results
Intra- and inter-class correlation coefficient values ranged between 0.92 and 0.97 for intra-rater reliability and between 0.91 and 0.96 for inter-rater reliability.

Are English-language YouTube videos a reliable source for adult orthodontics?

Table 1. Descriptive statistics of analyzed videos

	Parameters	Minimum	Maximum	Median	Mean	Standard deviation
Video characteristics	Views	5	3989254	5941.50	100687.02	435529.98
	Likes	0	67000	44.50	1677.74	7942.53
	Dislikes	0	2300	1.00	54.36	250.72
	Comments	0	6645	9.50	188.49	747.74
	Duration (seconds)	48	1387	385.50	466.33	351.88
	Number of subscribers	0	12900000	6300.00	504736.62	2054662.74
	Days since upload	72	4335	992.00	1226.30	988.94
	Interaction index	0	5.88	0.97	1.19	1.08
	Viewing rate	1.01	436809.62	930.7400	14501.14	62434.27
Analysis	Content score	0	6	2.00	1.74	1.48
	Reliability score	0	5	2.00	1.70	1.47
	VIQI score	4	20	7.00	9.00	4.32
	Flow	1	5	1.50	1.90	1.06
	Information accuracy	1	5	2.00	2.26	1.19
	Quality	1	5	2.00	2.10	1.17
		1	5	3.00	2.69	1.20

Table 2. Comparison of parameters according to uploaders

	Parameters	Patients (n=56) Mean±SD Min-Max (Median)	Orthodontists (n=34) Mean±SD Min-Max (Median)	Media Org. (n=16) Mean±SD Min-Max (Median)	p	Patients vs. Orthodontists	Patients vs. Media Org.	Orthodontists vs Media Org.
Video characteristics	Views	174552.58±590042.86 103-3989254 (13453)	20834.41±58164.31 5-3119936 (832.5)	11844.37±23824.95 31-79949 (1805)	0.000 ‡	0.000 ***	0.005 **	1.00
	Likes	3046.87±10770.55 0-67000 (169)	194.94±789.97 0-4600 (6.5)	36.75±90.09 0-367 (5)	0.000 ‡	0.000 ***	0.000 ***	1.00
	Dislikes	97.00±340.17 0-2300 (4)	8.17±24.58 0-136 (0)	3.31±5.37 0-16 (0.5)	0.005 ‡	0.010 *	0.095	1.00
	Comments	328.71±1003.62 0-6645 (44)	43.50±169.98 0-968 (0)	5.81±16.10 0-65 (0.5)	0.000 ‡	0.000 ***	0.000 ***	1.00
	Video length (minutes)	669.26±311.19 60-1387 (671.5)	274.17±276.40 48-1162 (183)	143.18±57.13 57-245 (141.5)	0.000 †	0.000 ***	0.000 ***	0.335
	Subscribers	370910.03±1453442.34 0-10600000 (6535)	19168.23±45480.95 0-216000 (2310)	2004962.50±4335792.45 0-1290000 (105000)	0.000 ‡	0.072	0.012 *	0.000 ***
	Days since upload	893.30±659.96 82-2185 (762)	1518.70±1225.43 72-4123 (1305.5)	1770.43±1010.78 144.00-4335.00 (1626.5)	0.001 †	0.008 **	0.004 **	1.00
	Interaction index	1.45±0.83 0-4.43 (1.34)	1.00±1.35 0-5.88 (0.51)	0.73±1.05 0-3.30 (0.37)	0.000 ‡	0.001 **	0.001 **	1.00
	Viewing rate	24966.45±83891.94 50.23-436809.62 (2257.88)	3797.95±16589.94 1.01-96874.53 (106.62)	616.80±1054.85 1.52-3607.81 (81.66)	0.000 ‡	0.000 ***	0.000 ***	1.00
Analyses	Content score	0.98±1.03 0-3 (1)	2.55±1.52 0-6 (2)	2.68±1.30 1.00-5.00 (2.5)	0.000 †	0.000 ***	0.000 ***	1.00
	Reliability score	0.96±1.04 0-3 (1)	2.47±1.52 0-5 (2)	2.68±1.30 1-5 (2.5)	0.000 †	0.000 ***	0.000 ***	0.266
	VIQI score	6.35±2.38 4-13 (6)	12.35±4.27 4-20 (13)	11.18±3.67 6-17 (11.5)	0.000 †	0.000 ***	0.000 ***	0.737
	Flow	1.32±0.60 1-3 (1)	2.76±1.07 1.00-5.00 (3)	2.12±1.02 1-4 (2)	0.000 †	0.000 ***	0.003 **	0.043 *
	Information accuracy	1.48±0.68 1-3 (1)	3.11±1.14 1-5 (3)	3.18±0.75 2-4 (3)	0.000 †	0.000 ***	0.000 ***	1.00
	Quality	1.37±0.67 1-3 (1)	3.00±1.10 1-5 (3)	2.75±1.00 1-4 (3)	0.000 †	0.000 ***	0.000 ***	1.00
	Precision	2.14±0.90 1-4 (2)	3.41±1.18 1-5 (4)	3.12±1.25 1-5 (3)	0.000 †	0.000 ***	0.004 **	1.00

†: One Way ANOVA test, ‡: Kruskal Wallis test, Min: Minimum, Max: Maximum, SD: Standard deviation, Org.: Organizations, p: Significance, * p<0.05, ** p<0.01, *** p<0.001

Table 3. Correlation matrix displaying Spearman's correlation coefficients and significance levels between parameters

Parameters		Video length	No. of views	No. of likes	No. of dislikes	No. of comments	Interaction index	Viewing rate	Content score	Reliability score	VIQI score
Video length	r	1.000	0.426**	0.540**	0.352**	0.543**	0.435**	0.539**	-0.282**	-0.288**	-0.256**
	p		0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.008
No. of views	r	0.426**	1.000	0.919**	0.885**	0.834**	0.156	0.882**	-0.144	-0.129	-0.102
	p	0.000		0.000	0.000	0.000	0.110	0.000	0.142	0.186	0.300
No. of likes	r	0.540**	0.919**	1.000	0.861**	0.903**	0.464**	0.904**	-0.260**	-0.244*	-0.226*
	p	0.000	0.000		0.000	0.000	0.000	0.000	0.007	0.012	0.020
No. of dislikes	r	0.352**	0.885**	0.861**	1.000	0.777**	0.175	0.789**	-0.151	-0.134	-0.104
	p	0.000	0.000	0.000		0.000	0.072	0.000	0.122	0.170	0.290
No. of comments	r	0.543**	0.834**	0.903**	0.777**	1.000	0.373**	0.878**	-0.285**	-0.269**	-0.195*
	p	0.000	0.000	0.000	0.000		0.000	0.000	0.003	0.005	0.045
Interaction index	r	0.435**	0.156	0.464**	0.175	0.373**	1.000	0.321**	-0.244*	-0.232*	-0.291**
	p	0.000	0.110	0.000	0.072	0.000		0.001	0.012	0.017	0.002
Viewing rate	r	0.539**	0.882**	0.904**	0.789**	0.878**	0.321**	1.000	-0.298**	-0.277**	-0.228*
	p	0.000	0.000	0.000	0.000	0.000	0.001		0.002	0.004	0.019
Content score	r	-0.282**	-0.144	-0.260**	-0.151	-0.285**	-0.244*	-0.298**	1.000	0.979**	0.742**
	p	0.003	0.142	0.007	0.122	0.003	0.012	0.002		0.000	0.000
Reliability score	r	-0.288**	-0.129	-0.244*	-0.134	-0.269**	-0.232*	-0.277**	0.979**	1.000	0.723**
	p	0.003	0.186	0.012	0.170	0.005	0.017	0.004	0.000		0.000
VIQI score	r	-0.256**	-0.102	-0.226*	-0.104	-0.195*	-0.291**	-0.228*	0.742**	0.723**	1.000
		0.008	0.300	0.020	0.290	0.045	0.002	0.019	0.000	0.000	

No: Number, r: Correlation coefficient, p: Significance, **: Correlation is significant at the 0.01 level (2-tailed), *: Correlation is significant at the 0.05 level (2-tailed).

Of the 150 videos, 44 were excluded due to the reasons stated in the exclusion criteria, including duplicates (n=17), absence of auditory or visual content (n=3), absence of content relevant to adult orthodontics (n=20), and containing an advertisement (n=4). As a result, the remaining 106 videos were included in the analysis. Table 1 presents descriptive statistics of the videos, including duration in seconds, number of views, number of likes and dislikes, number of comments, time since upload, number of subscribers of the corresponding YouTube channel, time since upload, and the interaction index, content, reliability, and VIQI scores. Mean interaction index score was 1.19∓1.08 and the mean number of views was 14,501.14∓62,434.27. The mean content, reliability, and VIQI scores were 1.74∓1.48, 1.70∓1.47, and 9.00∓4.32, respectively.

Table 2 presents a comparison of videos with regard to their uploaders. The videos were uploaded by three main groups including patients (53%), orthodontists (32%), and media organizations (15%). Although the number of views, likes, and comments and duration, interaction index, and viewing rate of the videos uploaded by patients were significantly higher compared to the videos uploaded by orthodontists and media organizations (p<0.01), their content, reliability, and VIQI scores were significantly lower (p<0.001). However, there was no significant difference between the videos uploaded by orthodontists and media organizations with regard to interaction index, viewing rate, and content, reliability, and VIQI scores (p>0.05). The YouTube channels of the videos uploaded by media organizations had significantly more subscribers than those of other two groups (p<0.05).

Table 3 presents a correlation matrix showing the relationship among the parameters. Accordingly, there was a significant positive correlation between video duration and interaction index (r=0.435; p=0.000) and viewing rate (r=0.539; p=0.000). Additionally, a significant negative correlation was found between video duration and content score (r=-0.282; p=0.003), reliability (r=-0.288; p=0.003), and VIQI score (r=-0.256; p=0.008).

The content score showed a very high positive correlation with VIQI score (r=0.742; p=0.00) and a high positive correlation with the reliability score (r=0.979; p=0.00). On the other hand, the interaction index established a significant negative correlation with content score (r=-0.244; p=0.012), reliability score (r=-0.232; p=0.017), and VIQI score (r= -0.291; p=0.002).

Discussion

Adults are becoming increasingly more aware of the fact that orthodontic treatment is also applied in adults and more and more adults apply for orthodontic treatment each year (4,26,27). YouTube provides content in the field of orthodontics as in many areas of healthcare and the content and quality of these videos have become a major concern among researchers from various healthcare professions (28-31). Nevertheless, the fact that YouTube videos are not peer reviewed for content and quality raises a question mark regarding the reliability of the content of the videos. To our
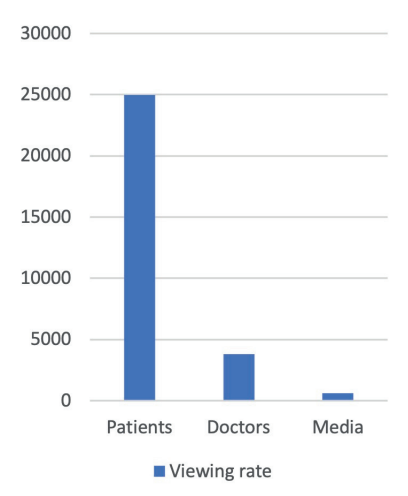
Are English-language YouTube videos a reliable source for adult orthodontics?

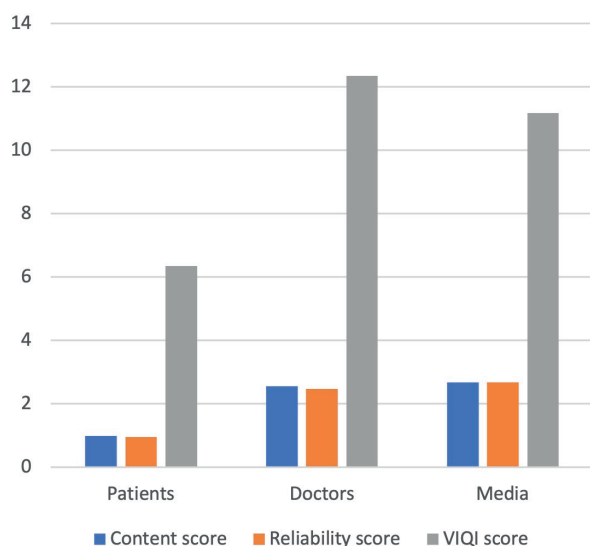**Figure 1. Viewing rates according to uploaders.**

Figure 2. Content, reliability, and VIQI scores according to uploaders

knowledge, there has been no study investigating the quality and reliability of YouTube videos on adult orthodontic treatment published in English language, which is a global language (32).

Most of the studies available in the literature have divided YouTube videos as poor and rich according to their content quality (19,33,34). In our study, no such classification could be performed since the majority of the videos (53%) were uploaded by patients. Therefore, the videos were grouped and compared according to their uploaders (patient, orthodontist, and media organization). The results indicated that 15% of the videos were uploaded by media organizations and included interviews with both patients and orthodontists. In those videos, the presenter initially introduced the subject matter and consulted an orthodontist via telephone or face-to-face interaction. It is commonly known that mass media is used as a means of obtaining information and reaching large masses (35,36). The present study is one of the first of its kind since it evaluated the videos uploaded by media organizations in terms of content, reliability, and quality.

To the best of our knowledge, there has been no study comparing the YouTube videos on orthodontics uploaded by patients vs. orthodontists. In our study, the videos uploaded by patients had approximately twenty times higher viewing rates than those uploaded by orthodontists and media organizations (Fig. 1). This finding implicates that adult viewers mostly preferred the videos that included the experiences of past and present patients and that patient candidates or viewers are interested in the experiences related to orthodontic treatment. Similarly, Pabari et al. (7) reported that one of the reasons motivating adults to seek orthodontic treatment is the presence of a friend/relative receiving orthodontic treatment. Accordingly, the inclusion of patients and their experiences in such videos ensures the delivery of real-life experiences to patient candidates and also makes the videos more interesting.

In our study, the mean content scores of the videos uploaded by patients, orthodontists, and media organizations were 0.98 (low), 2.55 (moderate), and 2.68 (moderate) out of a total score of 6, respectively (Fig. 2). Yavan and Gökçe (21) reported that all the videos were uploaded by orthodontic professionals. In our study, the content scores of the videos uploaded by orthodontists were compatible with those reported by Yavan and Gökçe. On the other hand, our findings showed that orthodontists' opinions are also included in the videos uploaded by media organizations, which could be the reason for the similar scores between the videos uploaded by orthodontists and media organizations. Nevertheless, it is expectable that the YouTube videos involving adult orthodontic patients are not rich in content since the patients mostly share their experiences about their own treatments.

The reliability scores in our study indicated no significant difference between the videos uploaded by orthodontists (2.55/5) and media organizations (2.68/5), while the scores of the videos uploaded by patients (0.96/5) were significantly lower than those of other two groups. Of these, only the scores of the videos uploaded by orthodontists and media organizations were consistent with those of Yavan and Gökçe (21). Additionally, it was expectable that the subjective experience shared by adult patients regarding their own treatment process would provide lower reliability scores. By contrast, the videos uploaded by patients had a significantly higher viewing rate compared to the videos uploaded by the other two groups, which could have significant implications for orthodontists regarding the preferences of patients and patient candidates.

The quality scores in our study indicated no significant difference between the videos uploaded by orthodontists (12.35/20) and media organizations (11.18/20), whereas

the scores of the videos uploaded by patients (6.35/20) were significantly lower than those of other two groups. Of these, only the scores of the videos uploaded by orthodontists and media organizations were consistent with those of Yavan and Gökçe (21). However, the videos uploaded by patients had a significantly higher viewing rate compared to the videos uploaded by the other two groups, which implicates that adult patient candidates or patients are more interested in patient experiences regardless of the quality of the videos.

Mean duration of videos in our study was 466.33 seconds (7.7 minutes), while the mean duration of videos analyzed in similar studies has been shown to vary between 1.49 and 7.40 minutes (19,21,33,34). Interestingly, the videos uploaded by patients had the longest duration among the three groups, with a mean duration of 11.1 minutes. This difference could be explained by the fact that the videos uploaded by patients, as opposed to those uploaded by orthodontists and media organizations, involved extensive details regarding patients' experiences such as their views and decision-making processes regarding orthodontic treatment and their experiences during the first examination and the early and later periods of treatment. Although the interaction index of long videos is expected to be relatively low due to the belief that long videos are typically boring and will lead to reduced interest among viewers after a certain period of time (19,33), an opposite result was found in our study, which indicated a significant positive correlation between the interaction index and viewing rates and the duration of videos. This finding was also consistent with the finding of Yavan and Gökçe (21) that indicated that the viewing rate increased as the duration of video increased. Meaningfully, unlike young individuals and children, adults may prefer more detailed and longer videos that provide information about long-term treatments such as orthodontic treatment rather than shorter videos.

In our study, the YouTube channels of the videos uploaded by media organizations had more subscribers and also had significantly higher content, reliability, and VIQI scores,

while they had significantly lower interaction scores and viewing rates compared to the channels of other videos. Although it is highly understandable that the YouTube news channels broadcasting in English language have high numbers of subscribers worldwide, their lower viewing rates compared to those of videos uploaded by patients implicate that the total number of subscribers is not a significant parameter affecting the viewing rates of videos on adult orthodontics.

Most important limitation of this study, as in similar studies, was its cross-sectional design. Additionally, it should be noted that the findings obtained in the present study only reflect the characteristics of the videos analyzed on the day of the study. YouTube is a highly dynamic platform, in which the numbers of views, likes, dislikes, and comments are constantly changing and an existing video can be removed from the platform and new videos are uploaded almost every second.

Conclusions

The findings obtained in the study could be summarized as follows:

1. Although the videos uploaded by patients had low content scores, the videos uploaded by orthodontists and media organizations had moderate scores.
2. The videos uploaded by orthodontic patients had low overall quality and reliability scores, while they had higher viewing rates and interaction scores.
3. Adult orthodontic patients/candidates were found to prefer to watch videos involving patient experiences.

Conflicts of interest
None to declare.

Data Availability Statement
I have read the journal's requirements for reporting the data underlying my submission (data policy in EJO Author instructions) and have included a Data Availability Statement within the manuscript.

Piśmiennictwo / References

1. Bagga DK. Adult orthodontics versus adolescent orthodontics: an overview. J Oral Health Comm Dent 2010; 4: 42-7.

2. Vanarsdall RLaM DR. Adult Interdisciplinary Therapy: diagnosis and treatment. In: Lee W. Graber RLV, Vig WLK, Huang GJ. Orthodontics: Current Principles and Techniques 2017.

3. Cedro MK, Moles DR, Hodges SJ. Adult orthodontics-who's doing what? J Orthod 2010; 37: 107-17.

4. Buttke TM, Proffit WR. Referring adult patients for orthodontic treatment. J Am Dent Assoc 1999; 130: 73-9.

5. Zachrisson BU. Global trends and paradigm shifts in clinical orthodontics. World J Orthod 2005; 6: 3-7.

6. Scott P, Fleming P, DiBiase A. An update in adult orthodontics. Dent Update 2007; 34: 427-38.

7. Pabari S, Moles DR, Cunningham SJ. Assessment of motivation and psychological characteristics of adult orthodontic patients. Am J Orthod Dentofacial Orthop 2011; 140: e263-72.

8. Sergl H, Zentner A. Study of psychosocial aspects of adult orthodontic treatment. Int J Adult Orthodon Orthognath Surg 1997; 12: 17-22.

9. Nattrass C, Sandy J. Adult orthodontics-a review. Br J Orthod 1995; 22: 331-7.

Are English-language YouTube videos a reliable source for adult orthodontics?

10. Varela M, Garcia-Camba J. Impact of orthodontics on the psychologic profile of adult patients: a prospective study. Am J Orthod Dentofacial Orthop 1995; 108: 142-8.

11. Johal A, Alyaqoobi I, Patel R, Cox S. The impact of orthodontic treatment on quality of life and self-esteem in adult patients. Eur J Orthod 2015; 37: 233-7.

12. Lew KK. Attitudes and perceptions of adults towards orthodontic treatment in an Asian community. Community Dent Oral Epidemiol 1993; 21: 31-5.

13. Tayer BH, Burek MJ. A survey of adults' attitudes toward orthodontic therapy. Am J Orthod 1981; 79: 305-15.

14. Papadimitriou A, Kakali L, Pazera P, Doulis I, Kloukos D. Social media and orthodontic treatment from the patient's perspective: a systematic review. Eur J Orthod 2020; 42: 231-41.

15. Antheunis ML, Tates K, Nieboer TE. Patients' and health professionals' use of social media in health care: motives, barriers and expectations. Patient Educ Couns 2013; 92: 426-31.

16. Burgess J, Green J. YouTube: Online video and participatory culture. John Wiley & Sons 2018.

17. Knösel M, Jung K. Informational value and bias of videos related to orthodontics screened on a video-sharing Web site. Angle Orthod 2011; 81: 532-9.

18. Guo J, Yan X, Li S, Van der Walt J, Guan G, Mei L. Quantitative and qualitative analyses of orthodontic-related videos on YouTube. Angle Orthod 2020; 90: 411-8.

19. Lena Y, Dindaroğlu F. Lingual orthodontic treatment: a YouTube™ video analysis. Angle Orthod 2018; 88: 208-14.

20. Yavuz MC, Buyuk SK, Genc E. Does YouTube™ offer high quality information? Evaluation of accelerated orthodontics videos. Ir J Med Sci 2020; 189: 505-9.

21. Yavan MA, Gökçe G. YouTube as a source of information on adult orthodontics: a video analysis study. J World Fed Orthod 2022; 11: 41-6.

22. Hassona Y, Taimeh D, Marahleh A, Scully C. YouTube as a source of information on mouth (oral) cancer. Oral Dis 2016; 22: 202-8.

23. Charnock D, Shepperd S, Needham G, Gann R. DISCERN: an instrument for judging the quality of written consumer health information on treatment choices. J Epidemiol Community Health 1999; 53: 105-11.

24. Singh AG, Singh S, Singh PP. YouTube for information on rheumatoid arthritis-a wakeup call? J Rheumatol 2012; 39: 899-903.

25. Nagpal SJS, Karimianpour A, Mukhija D, Mohan D, Brateanu A. YouTube videos as a source of medical information during the Ebola hemorrhagic fever epidemic. Springerplus 2015; 4: 1-5.

26. Khan R, Horrocks E. A study of adult orthodontic patients and their treatment. Br J Orthod 1991; 18: 183-94.

27. War I. The number of adults seeking orthodontic treatment in the UK continues to rise. Br Dent J 2018; 224: 847.

28. Delli K, Livas C, Vissink A, Spijkervet FK. Is YouTube useful as a source of information for Sjögren's syndrome? Oral Dis 2016; 22: 196-201.

29. Steinberg PL, Wason S, Stern JM, Deters L, Kowal B, Seigne J. YouTube as source of prostate cancer information. Urology 2010; 75: 619-22.

30. Yoo JH, Kim J. Obesity in the new media: a content analysis of obesity videos on YouTube. Health Commun 2012; 27: 86-97.

31. Korkmaz YN, Buyuk SK. YouTube as a patient-information source for cleft lip and palate. Cleft Palate Craniofac J 2020; 57: 327-32.

32. Melitz J. English as a global language The Palgrave handbook of economics and language: Springer 2016: 583-615.

33. Ustdal G, Guney AU. YouTube as a source of information about orthodontic clear aligners. Angle Orthod 2020; 90: 419-24.

34. Bozkurt AP, Gaş S, Zincir ÖÖ. YouTube video analysis as a source of information for patients on impacted canine. Int Orthod 2019; 17: 769-75.

35. Wang Z, Gantz W. Health content in local television news: A current appraisal. Health Commun 2010; 25: 230-7.

36. Wang Z, Gantz W. Health content in local television news. Health Commun 2007; 21: 213-21.