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Evaluation of Information Reliability and Quality of YouTube™ Videos about Teeth Whitening

Diş Beyazlatma ile İlgili YouTube™ Videolarının Bilgi İçeriği ve Kalitesinin Değerlendirilmesi

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ABSTRACT

Objective: The objective of this study was to assess the reliability and quality of information presented in YouTube™ videos related to teeth whitening.

Methods: YouTube™ videos were investigated by relevance for the term "Teeth Whitening". According to the inclusion criteria, 62 Turkish videos were evaluated. Data on the videos (number of views, video duration, number of likes, number of comments, viewing rate, video upload source, interaction index, and video power index) were determined. The reliability of the videos was evaluated with the Modified DISCERN (Mod DISCERN) scale, and their quality was assessed with the Global Quality Scale (GQS) scale. The Mann-Whitney U test and Spearman's rank correlation coefficient were utilized.

Results: In terms of the video upload sources, 74.2% (n=46) of the videos examined were patients, and 25.8% (n=16) were physicians. The median values for likes, comments, viewing rates, views, and video duration for the videos uploaded by patients were found to be higher than those uploaded by physicians ($P < .05$). The GQS ($P < .001$) and Mod DISCERN ($P < .001$) scores were found to be significantly higher in the videos uploaded by physicians compared with the videos uploaded by patients. There was a high correlation between GQS and Mod DISCERN scores (r=0.929, $P < .001$).

Conclusion: The information reliability and video quality of most videos shared on the YouTube™ platform about teeth whitening are not sufficient. Internet users should be very careful when using information obtained from the internet on health-related issues.

Keywords: Teeth whitening, Internet, Social Media, YouTube™

ÖZ

Amaç: Bu çalışmada diş beyazlatma ile ilgili YouTube™ videolarının bilgi güvenirliliği ve kalitesinin değerlendirilmesi amaçlandı.

Yöntem: YouTube™ videoları alaka düzeyine göre "Diş Beyazlatma" terimiyle arandı. Dahil edilme kriterlerini karşılayan 62 video çalışma kapsamında incelendi. Videolara ait veriler (görüntülenme sayısı, süresi, beğeni sayısı, yorum sayısı, izlenme oranı, video yükleme kaynağı, etkileşim indeksi, video güç indeksi) belirlendi. Videoların güvenilirliği Modifiye DISCERN (Mod DISCERN) ölçeği ve kalitesi Global Quality Skala (GQS) ölçeği ile değerlendirildi. İstatistiksel analizlerde Mann-Whitney U testi ve Spearman korelasyon katsayısı kullanıldı.

Bulgular: Video yükleme kaynağına göre incelenen videoların %74,2'si (n=46) hasta, %25,8'i (n=16) hekim kaynaklıdır. Hasta tarafından yüklenen videoların beğeni, yorum, izlenme oranı, video süresi ve izlenme sayıları medyanı hekim tarafından yüklenen videolardan daha yüksek bulundu ($P < ,05$). Videoların kalitesi bakımından hekim tarafından yüklenen videoların GQS ($P < ,001$) ve Mod DISCERN ($P <,001$) puanları hasta tarafından yüklenen videolara göre anlamlı düzeyde yüksek bulundu. GQS ile Mod DISCERN puanları arasında yüksek bir korelasyon bulundu (r=0,929, $P < ,001$).

Sonuç: YouTube™ platformunda diş beyazlatma hakkında paylaşılan çoğu videonun bilgi güvenilirliği ve video kalitesi yeterli değildir. İnternet kullanıcıları, internetten elde ettikleri bilgileri sağlıkla ilgili konularda kullanırken çok dikkatli olmalıdırlar.

Anahtar Kelimeler: Diş beyazlatma, İnternet, Sosyal medya, YouTube™

INTRODUCTION

Esthetic dentistry practices are an important part of current restorative procedures. Research on various materials and techniques has led to the determination of effective, reliable, and predictable whitening systems in restorative dentistry applications.[1] Nowadays, the increasing importance given to esthetics in many fields such as traditional oral and dental treatments, and esthetic smile applications have

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become some of the most popular and demanded treatments.[2] In modern dentistry, "teeth whitening" plays a very important role in cosmetic treatments performed to improve the esthetic appearance and self-confidence of individuals. Teeth whitening applications provide a more conservative treatment approach compared with other restorative treatment methods such as composite restorations, veneers, and crowns that are commonly used in the treatment of discolored teeth. Today, there are many simple, economical, and conservative teeth whitening methods.[3] Tooth discoloration may not cause biological issues, but it can have a negative impact on the lives of certain individuals, particularly in terms of their psychological and social well-being. One of the success criteria of the whitening treatment is that the patient feels better psychologically and socially after treatment as a result of the lightening of the tooth color. In most clinical studies on whitening, the post-treatment satisfaction of the patient has been assessed at the end of the treatment. The results of the pre- and post-treatment questionnaires completed by the patients were compared and evaluated, and the patients' views on improvement were objectively determined in terms of psychological and social aspects.[4]

Presently, with the increasing use of the internet, it is easy to obtain information on any subject thanks to the computers or smartphones that most individuals own. It is a fact that social media networks in particular have become the most important platforms that allow interactions among users. Although these platforms are used for a wide variety of purposes, in addition to patient–clinician informations sharing and interactions, they have become an important resource, especially for research topics that patients are curious about.[5] Using these platforms have led not only the patients but also the health professionals who treat them to work in this field.[6] What guides health professionals to accessing these studies is that they want to evaluate whether patients are correctly informed on the internet. Use of the YouTube™ platform increasingly used daily for information purposes. YouTube™ is a platform on which most of videos are watched, and new videos are uploaded every day.[7] Compared with other social media platforms, the YouTube™ platform is frequently visited by individuals who want to get information in terms of both general health and dental and esthetic applications.[8] Through this platform, physicians started uploading videos to the internet in order to inform their patients, to tell patients about their experiences, and to promote themselves. The quantity of videos posted for this purpose has significantly increased in recent years. However, because anyone may upload videos is concerning; uploaded videos may be made solely for financial gain, and the current quality control protocols are not effective in achieving thorough and credible content analysis. As a result, it is important to assess the reliability, accuracy, and quality of health information found on YouTube™.[9]

Today, social media is an important part of many people's lives and allows them to interact and exchange information. In fact, one of the reasons for the increasing demand for esthetic procedures is the widespread use of social media.[10] In addition, social media platforms have played a role in the expansion of the cosmetic dentistry field.[11] There is increasing interest in treatment approaches related to teeth whitening, which is especially relevant to the concept of esthetic dentistry. As a result, there are many videos on this subject on social media. However, the study in which he reliability and quality of information presented in YouTube™ videos related to teeth whitening were evaluated was not found in the literature. The feature that makes this study different is that only Turkish videos are evaluated. Therefore, the aim of this study was to assess the reliability and quality of information presented in YouTube™ videos related to teeth whitening.

METHODS

Ethics committee approval was not required, as this study was not conducted on humans and was conducted using a public website. A new YouTube™ account was created so that old searches did not affect video results and rankings before videos related to the "Teeth Whitening"' word search were identified. Teeth whitening-related Turkish videos uploaded through this account until February 2023 were reviewed without changing YouTube™ default settings or applying any filters. In previous studies on YouTube™ use cases, it has been stated that approximately 95% of users watch the first 60–200 of the videos ranked after the search results.[12,13] The first 100 videos retrieved using keyword were included, assuming that YouTube™ users often review the first five pages of their search results.[14,15]

Google Trends is an online tool that allows users to determine how often selected keywords in Google Search are queried over a given period,[16] this application was used at the start of the study to identify frequently used terms related to 'teeth whitening'. Search parameters were set as "teeth whitening"/ "all categories". The terms "diş beyazlatma" in Turkish were chosen as the keywords used in this research. The sample size was calculated using the G*Power version 3.1.9.4. According to the analysis result calculated with 0.05 error margin, 85% power, f=0.4 (large effect size), it was found that a minimum of 60 videos should be included in total.[16] Initially, non-Turkish videos, duplicate videos, and irrelevant videos (advertisements or financial) were excluded from this study. Informative videos prepared in Turkish by clinicians and individuals or patients with acceptable video quality (240p and above) and related to teeth whitening videos included in this research. Data recorded for the videos included the following: title and URL information's, video length (min), time from upload date to present day (days), who did the upload (dentist, patient), number of views, number of likes and dislikes, and number of comments.[17] Related video links are reserved for future consideration. Based on previous study,[18] for usefulness, each video was scored description of treatment, indications, contraindications, advantages of teeth whitening, disadvantages of teeth whitening, procedure of treatment, prognosis information, causes of failure. Each item was given one point if the information was mentioned in the video. The point range was 0 to 8, with 0 to 2 points representing low information content, 3 to 5 points representing moderate information content, 6 to 8 points representing high information content.[18] As a supplementary evaluation method, the GQS consisting of five questions was used to evaluate the quality of the videos for patients. The videos were evaluated using the GQS score, which is a 5-point scale. Scores were determined by calculating the total score of each video. Videos with a total GQS score of ≤3 were classified as low to poor quality, and videos with a score of >3 were classified as good to excellent quality.[16,19] Furthermore, the interaction index of the videos, (%)=(number of likes – number of dislikes/number of views)×100 and view rate (%)=(number of views)/(time since uploaded)×100, was calculated.[20] The video power index (VPI) value (like rate×view rate)/100) was calculated in conjunction with the like rate (number of likes×100/number of likes+number of dislikes) and views rate (views/days).[21] Modified DISCERN (Mod DISCERN) and Global Quality Scale (GQS) was presented in Table 1. The DISCERN scale was created to help people and information providers assess the quality of written content regarding available treatments for any health issue. A Mod DISCERN scale consisting of one to nine questions was used for the evaluation of visual media and information. All videos were evaluated for the integrity of the information contained in the content using the

Mod DISCERN scale which had five questions that could be answered with "yes" or "no," with each "yes" response worth one point.[16,22]

Statistical analysis

SPSS Version 22.0 (IBM *SPSS* Corp, Armonk, NY, USA) software package was used with a significance level of $P < .05$. Descriptive statistics were calculated for the YouTube™ video aspects analyzed, including the minimum, maximum, mean, standard deviation, and median. The normal distribution assumption of the data was assessed using the Kolmogorov-Smirnov test, which indicated that the data did not exhibit normal distribution. Pairwise group comparisons were performed using the Mann Whitney U test. Inter-observer consistency of values was evaluated in the intervals specified in Cohen's Kappa (κ) test.[23]

Table 1. Assessment tools for reliability (Mod DISCERN) and global quality scale (GQS) of teeth whitening videos on YouTube™

Modified DISCERN (1 point per question yes)
1. Is the video clear, concise, and understandable?
2. Are valid sources cited? (from valid studies)
3. Is the information provided balanced and unbiased?
4. Are additional sources of information listed for patient reference?
5. Does the video address areas of controversy/uncertainty?
Global Quality Scale
1. Poor quality, poor flow of the video, most important information missing, not at all useful for patients
2. Generally poor quality and poor flow, some information listed but many important topics missing, of very limited use to patients
3. Moderate quality, suboptimal flow, some important information is adequately discussed but others poorly discussed, somewhat useful for patients
4. Good quality and generally good flow. Most of the relevant information is listed, but some topics not covered, useful for patients
5. Excellent quality and excellent flow, very useful for patients

RESULTS

The present study analyzed 62 videos that met the inclusion criteria, which were reviewed by one researcher to determine their eligibility for inclusion or exclusion. 38 videos were excluded from the study because they did not meet the inclusion criteria (duplicate videos=9 and irrelevant videos=29). Seven days later, the same 62 videos were re-evaluated by another researcher. It was found that the agreement among the observers in terms of content scoring was almost perfect (κ=0.806). Table 2 displays the mean, standard deviation, median, minimum, and maximum values of the data. The mean number of views of the videos was 1,719,734.18±154,383.5; number of likes 20,483.11±95,701.1; number of dislikes 1,506.5±6,129.6; number of comments 616.05±2,178.08; video length (min) 6.65±6.19; days since upload 863.65±626.25; interaction index 1.52±1.23; video power index 2,476.94±11,051.21; viewing rate 266,080.67±1,182,412.86; Mod DISCERN score 2.31±1.31; and the GQS score 2.37±1.37 (Table 2).

According to the video upload source, 74.2% (n=46) of the videos examined were patients, and 25.8% (n=16) were physicians. A comparison of videos to sources of information is shown in Table 3. The median video duration for the videos uploaded by the patients were found to be longer and the median number of views to be greater than for the videos uploaded by the physicians ($P = .003$, respectively). The median number of likes ($P = .001$), number of dislikes ($P = .001$), number of comments ($P = .004$), viewing rates ($P = .008$), and VPI values ($P = .007$) of the videos uploaded by the patients were statistically significant compared with the videos uploaded by the physicians, which were found to be significantly higher (Table 3). In terms of the quality of the videos, the GQS ($P < .001$) and modified DISCERN scale ($P < .001$) scores were found to be significantly higher in the videos uploaded by the physicians compared with the videos uploaded by the patients (Table 3). Based on the GQS rating, 77.4% (n=48) of the videos were high-quality and 22.6% (n=14) were low-quality videos. The median duration of the videos uploaded by the patients was found to be significantly longer than the videos uploaded by the physicians ($P = .001$) (Table 4). The comparison of videos to usefulness of information is shown in Table 5. The median video duration had highest median value in high content videos. The usefulness scores showed that the level of informational content increased statistically as duration increased. The evaluation using the GQS indicated that the high-quality content of videos showed a statistically significantly higher Mod DISCERN and video duration. In this study spearman rank correlation coefficients were presented between video parameters in Table 6. There was a high correlation between GQS and Mod DISCERN scores ($r=0.929$, $P < .001$).

Table 2. Descriptive statistics of the videos (n=62)

	Mean ± std deviation	Median (Minumum-Maximum)
Number of views	1,719,734.18 ± 7,504,343.17	154,383.5 (36 – 57,227,473)
Video duration (minute)	6.65 ± 6.19	3.5 (1 - 27)
Days since upload	863.65 ± 626.25	728.5 (3 – 2,536)
Number of like	20,483.11 ± 95,701.1	2,189 (1 – 746,972)
Number of dislike	1,506.5 ± 6,129.6	114.5 (0 – 46,583)
Number of comments	616.05 ± 2,178.08	99.5 (0 – 16,802)
Viewing rate (%)	266,080.67 ± 1,182,412.86	22,550 (10.94 – 7,970,400.14)
Interaction Index	1.52 ± 1.23	1,25 (0.07 – 6.53)
Usefulness score	3.38 ± 2.61	3 (0 – 8)
Video Power Index	2,476.94 ± 11,051.21	191.98 (0.11 – 75,025.24)
Modified DISCERN score	2.31 ± 1.31	2 (1 - 5)
Global Quality Scale score	2.37 ± 1.37	2 (1 - 5)

DISCUSSION

This study evaluated the information reliability and quality of YouTube™ videos about teeth whitening. In studies on videos on the internet, scales recommended to be used for the evaluation of written scientific material are used, and it is recommended to develop appropriate methodology and scales for the evaluation of visual publications such as videos.[24] Therefore, the GQS and Mod DISCERN scales were used in this study.

It is widely accepted that the internet has become an important aspect of our daily life and will become the primary source of learning about it. Therefore, it is very important to ensure access to quality videos on digital platforms.[25,26] It has been stated that the YouTube™ platform is one of the most used social media platforms in the diagnosis, treatment, and prevention of diseases.[17] Unfortunately, there is no mechanism to check the accuracy of information on this platform which is frequently used by individuals. This is extremely important in terms of gaining medical information online.[27] For example, the results of YouTube™ video analysis studies related to dental issues have shown inconsistencies in video quality values.[25,26] Another point is that social media often provides patients with a more accessible communication network and makes it simpler for them to obtain information. However, sharing subjective opinions from information sources also brings certain risks. Patients may come across inaccurate information that prevents them from receiving treatment or from being guided to alternate treatment options.[28] Medical videos on YouTube™ sare not subject to any limitations or content regulations; as a result, their quality can be inadequate.[29] Also, because information can be easily shared on the internet and is accessible to internet users free of charge, it is not subject to a central quality control mechanism.

Table 3. Comparison of videos to source of information

	Dentist (n=16)		Patient (n=46)		
	Mean ± std deviation	**Median (Min-Max)**	**Mean ± std deviation**	**Median (Min-Max)**	***P****
Number of views	271,407 ± 645,763.78	3306.5 (36 – 2,541,137)	2,223,500.15 ± 8,671,452.11	251,991.5 (309 – 57,227,473)	.003
Video duration (minute)	4.38 ± 6.11	1 (1 - 20)	7.43 ± 6.09	5 (1 - 27)	.003
Days since upload	645.25 ± 605.27	531 (35 - 2175)	939,61 ± 621,82	829.5 (3 - 2536)	.72
Number of like	2136.5 ± 4018.74	26 (1 – 12,493)	26,864.54 ± 110,672.66	3081 (17 – 746,972)	.001
Number of dislike	120.81 ± 244.77	0 (0 - 908)	1988,48 ± 7070.42	129 (0 – 46,583)	.001
Number of comments	158.81 ± 351.94	0.5 (0 - 1190)	775.09 ± 2507.85	149 (0 – 16,802)	.004
Viewing rate	28,369.02 ± 47,364.39	1782.84 (10.94 – 174,169.77)	348,762.99 ± 1,366,519.32	25,554.74 (297.3 – 7,970,400.14)	.008
Interaction Index	1.28 ± 0.81	1.33 (0.07 – 2.78)	1.61 ± 1.35	1.25 (0.2 – 6.53)	.475
Video Power Index	267.81 ± 445.27	17.83 (0.11 – 1623.69)	3245,34 ± 12,772.94	232.61 (2.93 – 75,025.24)	.007
Modified DISCERN score	3.31 ± 0.95	3 (2 - 5)	1.96 ± 1.25	1 (1 - 5)	<.001
Global Quality Scale score	3.41 ± 0.92	3.5 (2 – 4.5)	2.01 ± 1.32	1.5 (1 - 5)	<.001

[a]Mann Whitney U

Table 4. Comparison of videos parameters according to Global Quality Scale values

	GQS scores ≤3 (n=48)		GQS scores>3 (n=14)		
	Mean ± std deviation	**Median (Min-Max)**	**Mean ± std deviation**	**Median (Min-Max)**	***P****
Number of views	2,119,424.38 ± 8,499,794.58	160,094.5 (161 – 57,227,473)	661,031.5 ± 139,823	154,383.5 (36 – 57,227,473)	.699
Video duration (minute)	5.31 ± 5.63	3 (1 - 27)	6.03 ± 12	3.5 (1 - 27)	.001
Days since upload	803.81 ± 612.74	723 (3 - 2536)	651.39 ± 955.5	728.5 (3 - 2536)	.148
Number of like	25,638.94 ± 108,459.43	2189 (3 – 746,972)	3374.62 ± 2411.5	2189 (1 – 746,972)	.522
Number of dislike	1891.73 ± 6933.69	91.5 (0 – 46,583)	243,91 ± 118	114.5 (0 – 46,583)	.826
Number of comments	725.9 ± 2464.78	65 (0 – 16,802)	315.08 ± 134	99.5 (0 – 16,802)	.665
Viewing rate	334,939.99 ± 1,338,856.91	25,903.83 (11.41 – 7,970,400.14)	29,991.58 ± 45,490.78	15008.86 (10,94 – 174169.77)	.178
Interaction Index	1.63 ± 1.34	1.37 (0.07 – 6.53)	0.68 ± 0.94	1.25 (0,07 – 6.53)	.300
Video Power Index	3117.48 ± 12,514.08	218.43 (0.11 – 75,025.24)	426.58 ± 142.14	191.98 (0.11 – 75,025.24)	.216
Modified DISCERN score	1.73 ± 0.82	1.5 (1 - 3)	0.47 ± 4	2 (1 - 5)	<.001

*Mann Whitney U

Table 5. Comparison of videos according to usefulness groups

	Low (n=27)		Moderate (n=19)		High (n=16)		
	Mean ± sd	**Median (Min-Max)**	**Mean ± sd**	**Median (Min-Max)**	**Mean ± sd**	**Median (Min-Max)**	***P****
Number of views	3561153,89 ± 11203738,64	315935 (309 - 57227473)	292216,74 ± 444109,67	36349 (161 - 1507158)	307515,38 ± 625927,67	100164 (36 - 2541137)	.68
Video duration (minute)	4 ± 2,75	3 (1 - 12)[a]	6,95 ± 7,83	5 (1 - 27)[a]	10,75 ± 6,22	12 (1 - 20)[b]	.008
Days since upload	783,59 ± 584,79	649 (3 - 1973)	852,11 ± 687,84	729 (35 - 2536)	1012,44 ± 631,71	829,5 (322 - 2274)	.443
Number of like	41521,63 ± 143474,55	4280 (17 - 746972)	5746,84 ± 10670,73	697 (3 - 34818)	2479,94 ± 3266,25	1396,5 (1 - 12493)	.059
Number of dislike	3008,89 ± 9139,57	140 (0 - 46583)	502,16 ± 756,07	23 (0 - 2503)	163,88 ± 234,81	117,5 (0 - 908)	.547
Number of comments	974,19 ± 3237,52	116 (0 - 16802)	444,74 ± 703,71	46 (0 - 2149)	215,13 ± 301,2	119,5 (0 - 1190)	.987
Viewing rate	5753,41 ± 17612,41	674,7 (3 - 79704)[a]	283,34 ± 409,69	47,6 (0,1 - 1335,6)[b]	265,28 ± 433,94	120,3 (0,1 - 1741,7)[b]	.004
Interaction Index	1,64 ± 1,37	1,2 (0,5 - 5,5)	1,69 ± 1,36	1,5 (0,4 - 6,5)	1,12 ± 0,71	0,9 (0,1 - 2,8)	.392
Video Power Index	5358,01 ± 16464,02	613,4 (2,9 - 75025,2)[a]	259,4 ± 389,76	47,6 (0,1 - 1246)[b]	248,48 ± 406,83	115,8 (0,1 - 1623,7)[b]	.002
Modified DISCERN	1,11 ± 0,32	1 (1 - 2)[a]	2,47 ± 0,51	2 (2 - 3)[b]	4,13 ± 0,62	4 (3 - 5)[c]	<.001
Global Quality Scale	1,17 ± 0,42	1 (1 - 2,5)[a]	2,5 ± 0,65	2 (1,5 - 3,5)[b]	4,25 ± 0,63	4,5 (3 - 5)[c]	<.001

[a-c] There is no difference between groups of usefulness with the same letter for each row (Dunn test). *Kruskall-Wallis

Table 6. Correlation of among factors

		1	2	3	4	5	6	7	8	9	10	11	12
1-Number of views	r	1											
	p												
2-Video duration (minute)	r	.299*	1										
	p	.018											
3-Days since upload	r	.456**	.403**	1									
	p	< .001	.001										
4-Number of like	r	.973**	.323*	.460**	1								
	p	< .001	.011	< .001									
5-Number of dislike	r	.923**	.427**	.566**	.913**	1							
	p	< .001	.001	< .001	< .001								
6-Number of comments	r	.676**	.549**	.633**	.723**	.770**	1						
	p	< .001	< .001	< .001	< .001	< .001							
7-Interaction Index	r	-.295*	.011	-.109	-.1	-.221	.084	1					
	p	.02	.93	.399	.439	.084	.518						
8-VPI	r	.870**	.132	.059	.850**	.712**	.432**	-.248	1				
	p	< .001	.308	.648	< .001	< .001	< .001	.052					
9-MD	r	-.248	.343**	.116	-.274*	-.153	.017	-.079	-.404**	1			
	p	.052	.006	.371	.031	.236	.897	.539	.001				
10-GQS	r	-.242	.309*	.149	-.269*	-.124	.008	-.049	-.407**	.929**	1		
	p	.058	.014	.246	.035	.336	.948	.706	.001	< .001			
11-Viewing rate	r	.880**	.143	.075	.856**	.736**	.450**	-.266*	.997**	-.403**	-.405**	1	
	p	< .001	.269	.564	< .001	< .001	< .001	.037	0	.001	.001		
12-Usefulness score	r	-.225	.368**	.138	-.856	-.124	.012	.091	.367**	.966**	.930**	-.365	1
	p	.078	.003	.284	.46	.339	.923	.484	.003	< .001	< .001	.004	

One study found that YouTube™ users watch the videos they download without knowing whether the content is correct or not.[12] As there are no restrictions or content guidelines for medical videos on YouTube™, the quality of these videos is often quite poor. Previous study[30] also support this, stating that most of the videos uploaded on health problems come from unauthorized sources. According to the findings of our study, the most watched, commented on, and liked videos were the ones uploaded by the patients. This finding is consistent with previous study conducted in the field of dentistry.[31] However, the results of this study showed that the majority of videos with accurate information were uploaded by physicians, and videos uploaded by patients had poorer information content. In particular, patient-based content that shares personal treatment processes or provides information based on their experiences is likely to be misleading for research users.[32] Interestingly, videos describing an individual's personal experience with teeth whitening, while less helpful, were viewed more often than videos uploaded by clinicians – probably because viewers find such videos more entertaining and therefore more willing to watch them.[12] However, there may be some concerns about more views of patients' uploaded videos. Patients' uploaded videos may not be based on reliable or accurate information, and may contain personal biases or anecdotal experiences that may not be applicable to everyone. Additionally, these videos may not have been reviewed or approved by dental professionals, and may not provide information on potential risks or side effects associated with teeth whitening. Patients' uploaded videos may promote teeth whitening methods (home bleaching) that may not be safe or effective. These methods may include using some whitening products that can cause damage to the teeth and gums. Therefore, it is important to critically evaluate the information presented in patient-created teeth whitening videos and seek out reliable sources of information, such as videos created by dental professionals or reputable organizations.

In our study, the length of the duration of the videos with high content was found to be significantly higher among to the usefulness groups. Although no significance was found, the number of views was negatively correlated with highly informative videos. In addition, the negative correlation between the viewing rate and the usefulness score was found to be significant. The previous study noted that the interaction index showed a positive correlation with video duration.[18] In our study, although these two parameters showed a positive correlation, but they were not significant. Yavuz et al.[25] compared video duration and viewing rates, and stated that short videos were watched more frequently. The video duration may be longer for more comprehensive videos. In addition, although there was an inverse correlation between the number of days since upload and the interaction index in this study, but it was not significant. This finding similar the argument of Nason et al.[13] that videos uploaded on past dates should have more views. This can be explained by the fact that internet users prefer not only new videos uploaded but also old videos uploaded.

In this study, the Mod DISCERN index according to the video source, the median values of the physicians were found to be significantly higher than the median values of the patients. In our study, it was observed that the videos prepared by professionals had higher information content. Even if a video is popular and has a large number of viewers, the video's content quality may not be high. However, more studies are needed as there are few studies investigating the correlation between video rating indices and the standardized assessment tool for comprehensive video assessment is unclear. In this current study, a positive high correlation was found between the Mod DISCERN and GSQ scores. Similarly, the results of some previous studies support our study.[16,19] However, it has been observed that videos with less informative content are more popular than videos with higher quality content, suggesting that the quality of the content may not be a very important factor for viewers. Despite this, the lack of a significant correlation between GQS and views suggests that the information available about teeth whitening on YouTube is often controversial and may contain insufficient or incorrect information that could lead to the spread of misinformation. This could potentially have adverse effects on patients' decision-making regarding teeth whitening.

In our study, it was seen that videos that are not rich in informative content are watched and liked more than videos that are rich in content. For this reason, it is thought that video content is not crucial to the audience. However, the lack of a significant relationship between the quality of the information and the number of views shows that the information that can be obtained on YouTube™ about teeth whitening is controversial. Many videos have inadequate information and inaccurate content, which raises the possibility of spreading misinformation. This might have a negative impact on the patient's actions related to teeth whitening. One study suggested the use of interfaces with evidence-based references to be implemented on YouTube™ to increase the circulation of reliable information.[9] In other study, it was found that individuals have confidence in their internet research results about health, but they do not research whether these results are correct or not, which can then affect their health-related treatment preferences. In the same study, it was found that when the patients explained how they decided on their treatment preferences, they stated that they had come to their decision by watching YouTube™ videos.[33] Based on the our findings, the information content of long videos was found to be of poor quality. It is considered that the videos uploaded by a non-physician include different topics, such as their own social life, making the videos longer. However, the videos with low information content were among the most watched and liked videos. In addition, it was discovered that low information content had a higher audience interaction index than reliable information content. Possibly, this is because the uploaders' (patients') videos are easier to understand.[31]

Similar to the previous study in dentistry,[34] it was found that the number of videos with high content was low in our study. In the current study, the information content described in most of the videos included the treatment process, the advantages and disadvantages of the treatment, and the post-treatment process. Patients should be aware of the symptoms that may occur after treatment. Our research also revealed that longer videos tend to have higher informational content and quality; This may be because clinicians who are well-versed in the subject explain content information more clearly than others. Interestingly, videos with low information content were found to have a higher viewing rate and video power index than videos with high information content. These results suggest that people who produce and share video content on teeth whitening should review their knowledge level and enable them to present their content more effectively. At the same time, clinicians need to take into account the needs of their target audiences and use understandable language when creating informative content on digital platforms.

This study has some limitations. It should be noted that YouTube™ platform data may, and probably does, change constantly. The fact that videos are uploaded with new content every day and that these downloads are free allows us access to many videos; however, it is not possible for users to watch all the videos, and this was the case in our study. Using a long uptime can result in massive amounts of social media

data that are frequently overwhelming and challenging to evaluate. Also, it needs to be noted that only Turkish videos were included in this study. Nevertheless, YouTube™ is a sizable platform with quite helpful videos in both English and other languages. For this reason, in light of the data provided by the study, it would be important to evaluate YouTube™ videos on teeth whitening in other languages.

CONCLUSION

The content of the information that individuals obtain from on the YouTube™ platform videos is low-level quality and does not provide enough information. Thus, it is essential for users to download content produced by health professionals as that information will be more accurate and credible but is equally important that the content should be clear and understandable to the average person. Internet users should be very careful when using information obtained from the internet on health-related issues. YouTube™ videos regarding teeth whitening that have been checked by health professionals should be preferred. More research is needed to assess the quality and reliability of teeth whitening across various platforms.

Ethics Committee Approval: No humans or animals were involved in this study; therefore, ethical permission was not obtained.
Informed Consent: Patient consent is not required as it is publicly available on the website where everyone can easily access it.
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Etik Komite Onayı: Bu çalışmada hiçbir insan veya hayvan kullanılmamıştır; bu nedenle etik izin alınmamıştır.
Hasta Onamı: Herkesin kolayca erişebileceği şekilde web sitesinde kamuya açık olduğundan hasta onayı gerekli değildir.
Hakem Değerlendirmesi: Dış bağımsız.
Yazar Katkıları: Fikir– M.F.; - Tasarım: M.F., Ö.Y.; - Veri Toplama veya İşleme - M.F., Ö.Y.; - Analiz veya Yorumlama - M.F., Ö.Y.;- Literatür Taraması - M.F., Ö.Y.; - Yazım - M.F., Ö.Y.
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