

# The Quality of Information on Instagram About Teeth Whitening

## *Instagram'da Diş Beyazlatma Hakkındaki Bilgilerin Kalitesi*

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### ABSTRACT

**Objective:** With the increasing importance of visual and aesthetic factors, coupled with the emergence of the influence of social media, teeth whitening procedures have become one of the most sought-after dental aesthetic treatments by patients. The study aims to evaluate the quality of informational content in public shared Instagram posts related to teeth whitening.

**Methods:** A total of 1000 posts were scanned on Instagram using the hashtag #teethwhitening. Posts were evaluated using the Global Quality Scale (GQS) and the reliability of information toolkits. Statistical analysis was performed using the Kruskal-Wallis and Dunn Test. A significance level of  $P < .050$  was adopted.

**Results:** A total of 45 photos and 53 video shares that met the criteria were analyzed. Posts were shared by dentists (38 posts), clinics (35 posts), and patients (25 posts). It was determined that the information reliability scores of Instagram video shares related to #teethwhitening were quite low. Both the information reliability score and the Global Quality Scale score showed a significant difference between the videos shared by dentists and those shared by clinics ( $P < .05$ ). The videos shared by dentists had higher information reliability scores and Global Quality Scale scores.

**Conclusion:** Given that social media is commonly utilized as a platform for accessing medical information, dentists need to stay informed about the content available on Instagram.

**Keywords:** Teeth whitening, instagram, social media, bleaching, dentistry

### ÖZ

**Amaç:** Görsel ve estetik faktörlerin artan önemi ve sosyal medyanın etkisinin ortaya çıkmasıyla birlikte, diş beyazlatma işlemleri hastalar tarafından en çok talep edilen estetik diş tedavilerinden biri haline gelmiştir. Bu çalışmanın amacı, Instagram'da diş beyazlatma ile ilgili herkese açık olarak paylaşılan gönderilerin bilgi içeriğinin kalitesini değerlendirmektir.

**Yöntem:** Instagram'da #teethwhitening etiketi kullanılarak toplam 1000 gönderi taranmıştır. Gönderiler, Global Kalite Ölçeği (GQS) ve bilgi güvenilirliği araç setleri kullanılarak değerlendirilmiştir. İstatistiksel analizlerde Kruskal-Wallis ve Dunn testleri uygulanmış, anlamlılık düzeyi  $P < .05$  olarak belirlenmiştir.

**Bulgular:** Kriterleri karşılayan 45 fotoğraf ve 53 video paylaşımı analiz edilmiştir. Paylaşımlar diş hekimleri (38 gönderi), klinikler (35 gönderi) ve hastalar (25 gönderi) tarafından yapılmıştır. #teethwhitening etiketiyle yapılan Instagram video paylaşımlarının bilgi güvenilirliği puanlarının oldukça düşük olduğu belirlenmiştir. Hem bilgi güvenilirliği puanı hem de Global Kalite Ölçeği puanı açısından, diş hekimleri tarafından paylaşılan videolar ile klinikler tarafından paylaşılanlar arasında anlamlı fark olduğu bulunmuştur ( $P < .05$ ). Diş hekimleri tarafından paylaşılan videolar daha yüksek bilgi güvenilirliği ve kalite puanlarına sahiptir.

**Sonuç:** Sosyal medya genellikle tıbbi bilgiye erişim aracı olarak kullanıldığından, diş hekimlerinin Instagram'da yer alan içeriklere dair bilgi sahibi olmaları önem arz etmektedir.

**Anahtar Kelimeler:** Diş beyazlatma, instagram, sosyal medya, beyazlatma, diş hekimliği

### INTRODUCTION

The internet is a constantly expanding communication network that connects numerous computer systems worldwide. It serves as the most valid means for easily, affordably, and quickly accessing and sharing information.<sup>1</sup> As network systems and technologies have advanced, the internet has evolved into an essential component of modern human life.<sup>1,2</sup>

Social media is defined as online applications through which individuals share information, experiences, opinions, and thoughts via the internet. With the growing prevalence of social media platforms, individuals have the ability to communicate with their families, friends, or anyone worldwide, enabling them to share their thoughts and experiences.<sup>3</sup> Users have the ability to share photos and videos on Instagram which can be liked, commented on, or saved by their followers. Similar to Twitter,

and Facebook Instagram utilizes hashtag content, enabling users to search for content of interest. When a search is performed using a hashtag, Instagram compiles posts that have been shared using that particular hashtag.<sup>4,5</sup> In today's world, Instagram is widely used by both patients and healthcare professionals. Since most of the posts on the platform are shared publicly, users can conduct comprehensive research without being disturbed.<sup>6</sup> Factors such as convenient and rapid accessibility, patients' desire for more information, and the cost of accessing professional healthcare services contribute to the utilization of the internet for obtaining medical information. It is acknowledged that 8 out of 10 internet users engage in online searches for medical information.<sup>7</sup> Various medical topics such as breast cancer, weight control during pregnancy, scoliosis correction surgeries, and obesity have been evaluated in the literature through Instagram videos.<sup>8-11</sup> There are studies that assess Instagram posts related to various oral health and dentistry topics, including genioplasty, bruxism, orthognathic surgery, and wisdom teeth.<sup>3,12-14</sup>

Instagram is a commonly utilized social platform by individuals seeking information on dental and oral health through social media.<sup>15</sup> Due to reasons such as long waiting times in clinics and patients hesitating to ask questions to healthcare professionals, accessing medical information online is often preferred. In many developed countries, many patients conduct internet research before visiting a clinic. Dentistry is also affected by this trend, as many patients research information online before dental treatments to gather insights about potential issues. Additionally, social media is frequently used to promote dental treatments and share their results.<sup>16,17</sup>

Patients desire both a beautiful smile and white teeth. Therefore, they often express dissatisfaction either with the natural color of their teeth or complain about discoloration caused by external factors.<sup>18,19</sup> Studies with data from different countries have reported a high percentage of individuals dissatisfied with the color of their teeth, ranging from 32.3% to 64.1%.<sup>20-22</sup> Teeth whitening is a popular cosmetic procedure among patients, and it can be performed using various materials, either at a dental clinic or at home.<sup>23</sup> When reviewing the literature, studies evaluating the quality of social media posts related to dentistry are generally conducted on YouTube™ shares. There are two studies in the literature dated 2022 and 2020 that assess the informational content of teeth whitening-related posts on YouTube™.<sup>24,25</sup> However, there are few studies in the literature that analyze the information quality of Instagram posts about teeth whitening. Teeth whitening procedures are commonly favored by patients today and are frequently posted on social media by individuals, healthcare professionals, and clinics for diverse reasons. The purpose of this study is to assess the quality of informative content in publicly shared Instagram posts using the hashtag #teethwhitening. The null hypothesis of the study is that the informative content of publicly shared Instagram posts using the hashtag #teethwhitening is not sufficient.

## METHODS

Ethical approval was not obtained for this study because only publicly available Instagram posts were analyzed. Therefore, informed consent was not obtained, as no human participants were directly involved in the study. The data for this study was manually collected from Instagram. To ensure that the included posts were not influenced by previous searches, a new Instagram account was created on November 10, 2023. The search language was set to English. Trending hashtags (#) related to teeth whitening were scanned using the Instagram search engine's autocomplete feature. By entering #teeth in

the search bar, trending hashtags related to teeth whitening were identified based on their popularity and the purpose of this study. This process was repeated three times with a two-week interval between each search. During each search period, the most popular hashtag was determined to be #teethwhitening (with over 4.6 million posts), and the study data was completed considering this hashtag. The research data was collected on December 25, 2023, by two researchers specializing in Restorative Dentistry (S.B.O, B.K.K.K) through manual searches on Instagram using keywords. A total of 1000 posts were examined, and the data were classified based on various criteria such as type (video, photo), likes/views, country of publication, language, number of hashtags, publisher (healthcare professional, patient, clinic), and purpose of publication (post, advertisement, experience, information). In this study, posts in different languages shared with the teethwhitening hashtag were also evaluated. These posts contained English subtitles and descriptions. Any data obtained through keyword searches that were not relevant to the topic were excluded from the study. This exclusion covered personal images unrelated to teeth whitening and promotional posts containing only hashtags.

The included data was organized into different folders using Instagram's save feature. Since there was no material collected from individuals in the study, ethical approval was not obtained. After excluding videos that did not meet the criteria, all remaining videos were analyzed and scored on a scale from 1 to 5 (Confidence Score) for content, accuracy, and reliability, using a 5-point scale. The Global Quality Scale (GQS) was used to assess the quality of the videos. GQS is a scale where ratings range from 1 to 5, with five points of assessment: 1 point - Poor quality, 2 points - Low quality, 3 points - Moderate quality, 4 points - High quality, 5 points - Excellent quality. Two researchers specializing in Restorative Dentistry (S.B.O, B.K.K.K) conducted the GQS assessment based on accuracy, content, currency, visual appeal, and topic coherence according to their overall judgment. In case of disagreement, a third researcher specializing in Restorative Dentistry (B.O) made the final decision. The research workflow diagram is shown in Figure 1. The data were analyzed using IBM SPSS (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY, USA). Normal distribution suitability was assessed using the Shapiro-Wilk Test. For data that did not conform to normal distribution within groups, the Kruskal-Wallis Test was utilized, followed by multiple comparisons using the Dunn Test. Analysis results were presented in the form of mean ± standard deviation and median (minimum – maximum). A significance level of  $P < .05$  was adopted.

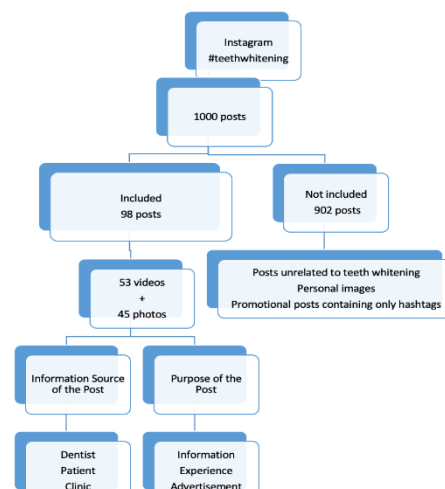


Figure 1. Research workflow diagram

## RESULTS

A total of 1000 posts with the #teethwhitening hashtag were considered for evaluation. It was determined that 902 of these posts were not related to teeth whitening applications. Finally, 98 posts that were identified as relevant to the topic were included in the assessment. Out of the examined 98 posts, 45 were photos, and 53 were videos shares (Figure 1). The frequency distributions of the posts are provided in Table 1.

**Table 1.** Frequency distributions of posts

	Frequency	Percentage
Video/Photo		
Photo	45	45.9
Video	53	54.1
Information Source of the Post		
Dentist	38	38.8
Patient	25	25.5
Clinic	35	35.7
Purpose of the Post		
Information	31	31.6
Experience	21	21.4
Advertisement	46	46.9
Language Used in the Post		
German	2	2
Arabic	2	2
Chinese	1	1
English	89	90.8
Spanish	1	1
Turkish	3	3.1
Country of Post		
USA	53	54.1
Germany	3	3.1
Australia	2	2
United Arab Emirates	3	3.1
India	5	5.1
England	11	11.2
Iceland	8	8.2
Malaysia	1	1
Mexican	1	1
Sweetcorn	1	1
Pakistan	1	1
Syria	1	1
Türkiye	8	8.2

Table 2 compares the number of views, information reliability, and GQS scores of posts based on their source. The median values of the number of views per post did not show a statistically significant difference based on the post sharer ( $P=.606$ ). However, both the information reliability score and GQS score exhibited a significant difference between the posts shared by dentists and those shared by clinics ( $P<.05$ ). Posts shared by dentists had higher information reliability scores and GQS scores. Table 3 shows the comparison of the number of views, information reliability and GQS score according to the purpose of sharing. The median values of the number of views per post did not show a statistically significant difference based on the purpose of the post ( $P=.752$ ). When evaluating the information reliability score based on the purpose of the post, both the information reliability score and GQS score showed a significant difference between informational and promotional posts. Informational posts had higher information reliability scores and GQS scores in this context.

**Table 2.** According to the information source of the post; comparison of video views, Reliability of information Score and Global Quality Scale (GQS) Score

	Information Source of the Post			Test Statistics	P*
	Dentist	Patient	Clinic		
Number of views	7375.83 ± 11043.62 2950.5 (819 - 45300)	9742.41 ± 13726.89 1288 (145 - 38000)	25165.5 ± 59096.46 1696.5 (176 - 218000)	1.001	.606
Reliability of information Score	2.5 ± 1.34 2 (1 - 5) <sup>p</sup>	1.76 ± 0.83 2 (1 - 3) <sup>ab</sup>	1.43 ± 0.65 1 (1 - 3) <sup>a</sup>	6.638	.036
Global Quality Scale (GQS) Score	2.5 ± 1.34 2 (1 - 5) <sup>p</sup>	1.82 ± 0.88 2 (1 - 3) <sup>ab</sup>	1.43 ± 0.65 1 (1 - 3) <sup>a</sup>	6.481	.039

\*Kruskal Wallis Test; mean ± Standard deviation; Median (minimum – maximum); a-b: There is no difference between groups with the same letter

**Table 3.** According to the purpose of the post; Comparison of view count, Reliability of information Score and Global Quality Scale (GQS) Score

	Purpose of the Post			Test Statistics	P*
	Information	Experience	Advertisement		
Number of views	7345.18 ± 11401.22 2878 (176 - 45300)	10601.57 ± 14799.49 1194 (355 - 38000)	20967.39 ± 52365.87 2743 (145 - 218000)	0.569	.752
Reliability of information Score	2.65 ± 1.27 2 (1 - 5) <sup>b</sup>	1.86 ± 0.86 2 (1 - 3) <sup>ab</sup>	1.33 ± 0.59 1 (1 - 3) <sup>a</sup>	12.411	.002
Global Quality Scale (GQS) Score	2.71 ± 1.21 2 (1 - 5) <sup>b</sup>	1.93 ± 0.92 2 (1 - 3) <sup>ab</sup>	1.28 ± 0.57 1 (1 - 3) <sup>a</sup>	15.607	<.001

\*Kruskal Wallis Test; Mean ± Standard deviation; Median (minimum – maximum); a-b: There is no difference between groups

## DISCUSSION

The reliability of searching for information on the internet and social media platforms is a topic frequently debated. Nevertheless, it is clear that contemporary individuals rely on the internet and social media for convenient access to information. This circumstance provides a substantial opportunity for healthcare providers, including doctors and clinics, to disseminate evidence-based information on different treatment methods to the public. Yet, patients are not exclusively influenced by professional and evidence-based viewpoints; they are also swayed by the opinions and experiences shared by other patients on social media.<sup>3</sup>

In studies related to online videos, it is recommended to use scales such as JAMA and DISCERN for evaluating written scientific material, while it is suggested to develop appropriate methodologies and scales for evaluating visual publications such as videos.<sup>26</sup> After excluding videos that did not meet the inclusion criteria, all remaining suitable videos were analyzed for content, accuracy, and reliability using a 5-point scale ranging from 1 to 5 (Confidence Score). This scale is based on five questions derived from DISCERN, a tool used for evaluating written health information.<sup>27</sup> In assessing the quality of the videos, the GQS was used, which evaluates both video quality and content together.

In today's world, people believe that a good smile can make them appear healthier, happier, and more attractive.<sup>28</sup> With the increasing importance of visual and aesthetic factors, coupled with the influence of social media, teeth whitening procedures have become one of the most sought-after dental aesthetic treatments. The demand for teeth whitening treatments has witnessed a notable surge. In a study conducted by Şimşek et al.<sup>25</sup> which assessed the quality and content of teeth whitening-related videos on YouTube™, it was observed that YouTube™ users displayed substantial interest in videos related to

teeth whitening. The researchers noted a substantial number of uploads from both professionals and non-professionals, with these videos garnering high view counts. Rachmawati et al.<sup>24</sup> found that videos uploaded to YouTube™ by ordinary individuals related to teeth whitening had more viewers, while information provided by healthcare professionals was of higher quality. The results obtained in our study are consistent with the findings of these two studies. When reviewing the literature, previous studies have consistently found that videos with good informational content are uploaded to social media platforms by professionals.<sup>24,25,29</sup> In our study, which aimed to evaluate the information quality and reliability of Instagram posts shared with the hashtag #teethwhitening, it was observed that videos shared by dentists had higher scores for both information reliability and GQS compared to videos shared by clinics (Table 2).

Instagram has become a widely used social media platform, particularly for advertising purposes. In dentistry, it can be utilized for promotional purposes, providing potential patients with quick before-and-after images, offering information about expected results<sup>12</sup>. Dorfman et al.<sup>5</sup> reported that Instagram provides more visual engagement compared to other social media platforms, making it the most popular platform for advertising, especially targeting young adults. This result is consistent with our study, where the majority of the examined Instagram posts were shared for promotional purposes (Table 3). Users can add up to 30 hashtags to a post on Instagram. Adding hashtags is a great way to find new followers and increase the visibility of a post.<sup>30</sup> Therefore, sometimes irrelevant hashtags may be used in posts, as Instagram hashtags enhance the visibility of posts, reaching a larger audience. In this study, out of the 1000 Instagram posts examined, 902, even if they included the #teethwhitening hashtag, were found to be irrelevant to the subject. The purpose of the Instagram application is not to serve as a facilitator for presenting accurate treatment options and methods in healthcare, and the platform does not take responsibility for the accuracy of information and the quality of content. If there are no complaints, the company does not intervene in user posts. Therefore, Instagram can not be considered a completely reliable source of information for patients regarding teeth whitening. Given that social media is commonly utilized as a source of medical information, dentists should stay informed about the content available on Instagram and contemplate utilizing it as a means for health education. The active presence of dentists on social media and effective communication with patients are crucial ways to convey accurate information to patients and reach new ones. Dentists should advise their patients about the reliability of information on Instagram and guide them to accurate social media sources. The limitation of the research is that it was conducted in a specific time frame and with a single hashtag. However, when considering that the research reveals online scanning results conducted very recently, this limitation can be viewed as a strength. Another constraint is that, although the quality of videos was examined using the Global Quality Score (GQS), research of this kind may fall short in definitively demonstrating the academic accuracy and evidence-based currency of online information in terms of methodological aspects. Nevertheless, this study is believed to contribute significantly to the literature by presenting the current results of a comprehensive survey through the scoring and personal evaluations of expert physicians in the relevant field.

## CONCLUSION

Patients actively use social media to research and gather information about teeth whitening. When they search on Instagram using the relevant hashtag, they may come across posts unrelated to the

topic. Patients who seek accurate information need to be cautious when conducting research on social media platforms. Dentists who intend to use social media to educate patients should be knowledgeable about the content available on Instagram.

**Ethics Committee Approval:** Since public posts on Instagram have been reviewed, ethical approval has not been obtained.

**Informed Consent:** Since there were no participants in our study, an informed consent form has not been obtained.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept –B.Ö., S.B.Ö., B.K.K.; Design –B.Ö., S.B.Ö., B.K.K.; Supervision – B.Ö., S.B.Ö., B.K.K.; Resources – B.Ö., S.B.Ö., B.K.K.; Materials – B.Ö., S.B.Ö., B.K.K.; Data Collection and/or Processing – B.Ö., S.B.Ö., B.K.K.; Analysis and/or Interpretation –B.Ö., S.B.Ö., B.K.K.; Literature Search – B.Ö., S.B.Ö., B.K.K.; Writing Manuscript – B.Ö., S.B.Ö., B.K.K.; Critical Review – B.Ö., S.B.Ö., B.K.K.; Other – B.Ö., S.B.Ö., B.K.K.

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**Etik Komite Onayı:** Instagram'daki herkese açık paylaşımlar incelendiğinden etik onayı alınmamıştır.

**Hasta Onamı:** Çalışmamıza katılımcı alınmadığından bilgilendirilmiş onam formu alınmamıştır.

**Hakem Değerlendirmesi:** Dış bağımsız.

**Yazar Katkıları:** Fikir – B.Ö., S.B.Ö., B.K.K.; Tasarım – B.Ö., S.B.Ö., B.K.K.; Denetleme – B.Ö., S.B.Ö., B.K.K.; Kaynaklar – B.Ö., S.B.Ö., B.K.K.; Malzemeler – B.Ö., S.B.Ö., B.K.K.; Veri Toplanması ve/veya İşlenmesi – B.Ö., S.B.Ö., B.K.K.; Analiz ve/veya Yorumlama – B.Ö., S.B.Ö., B.K.K.; Literatür Taraması – B.Ö., S.B.Ö., B.K.K.; Makale Yazımı – B.Ö., S.B.Ö., B.K.K.; Eleştirel İnceleme – B.Ö., S.B.Ö., B.K.K.; Diğer – B.Ö., S.B.Ö., B.K.K.

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