



Analyzing Content and Information Quality of Instagram® Posts About #teethwhitening

Mehmet Buldur^{1-a*}, Tuğba Misilli^{1-b}, Gizem Ayan^{1-c}

¹ Department of Restorative Dentistry, Faculty of Dentistry, Çanakkale Onsekiz Mart University, Çanakkale, Türkiye.

*Corresponding author

Research Article

History

Received: 08/03/2023

Accepted: 22/08/2023

ABSTRACT

Objectives: Getting information on health issues from social media applications provides autonomy to patients; however, different types of content can lead to the development of inappropriate norms. This study therefore aimed to evaluate the content and information quality of Instagram® posts about teeth whitening.

Materials and Methods: The first 100 posts were included in the three search periods, which started in October 2022 and were carried out at two-week intervals. (n=300) The #teethwhitening hashtag, which was determined as a trend topic in each search period, was used. The content of the posts was analyzed over eight questions, whereas their general information quality was analyzed according to the modified DISCERN analysis on seven questions. The demographic data of the posts were evaluated in two parts: a) account and b) data of the post. The distribution of the user questions and other hashtags (#) mentioned in the posts were also analyzed. Data normality checked via the Shapiro Wilk test, then applied Mann Whitney U, Kruskal Wallis, Bonferroni tests, and Spearman correlation as needed for non-normal data.

Results: 191 posts were excluded from the research. 42% (n=46) of the posts had "low" information content. In addition, the mean value of the content was 2.77 (min 0, max 8/n=109). The mean score in the modified DISCERN score was 11.83 (min 7, max 35/n=109). 53% (n= 57) of the posts were related either to prosthetic treatments alone or to combined treatments that included prosthetic procedures. Most of the posts mentioned the hashtag "#veneers". Questions such as cost, duration of treatment, and appointment procedures were also asked as comments under the posts.

Conclusions: It can be stated that the content and information quality of Instagram® posts about #teethwhitening are insufficient and may direct patients to more interventional invasive treatment options.

Key words: Misinformation, Social Media, Teeth Whitening, Internet, Dental Esthetics.

#Diş Beyazlatma Hakkında Instagram® Gönderilerinin İçerik ve Bilgi Kalitesinin Analizi

Süreç

Geliş: 08/03/2023

Kabul: 22/08/2023

Öz

Amaç: Sosyal medya uygulamalarından sağlıklı ilgili konularda bilgi alabilmek hastalara özerklik sağlamaktadır. Öte yandan içerik bolluğu, zararlı görüşlerin gelişmesine yol açabilmektedir. Çalışmamızda diş beyazlatma ile ilgili Instagram® gönderilerinin içerik bilgisi ve genel bilgilendirme kalitelerinin değerlendirilmesi amaçlanmaktadır.

Gereç ve Yöntemler: İlk 100 gönderi, Ekim 2022'de başlayan ve iki haftalık aralıklarla gerçekleştirilen üç arama döneminde çalışmaya dahil edildi. (n=300) Her arama döneminde trend konu olarak belirlenen #teethwhitening etiketi kullanıldı. Gönderilerin içeriği sekiz soru üzerinden, genel bilgi kalitesi ise yedi soru üzerinden modifiye DISCERN analizine göre analiz edildi. Gönderilerin demografik verileri, a) hesap ve b) gönderiye ait veriler olmak üzere iki bölümde değerlendirildi. Gönderilerde bahsedilen kullanıcı sorularının ve diğer (#) etiketlerin dağılımı da analiz edildi. Verinin normal dağılımı Shapiro Wilk testi ile kontrol edildi, daha sonra normal dağılım göstermeyen veriler için gerektiği gibi Mann Whitney U, Kruskal Wallis, Bonferroni testleri ve Spearman korelasyonu uygulandı.

Bulgular: 191 gönderi araştırma dışı bırakıldı. Paylaşımların %42'si (n=46) "düşük" bilgi içeriğine sahiptir. Ayrıca bilgilendirme puan ortalaması 2.77'dir (min 0, max 8/n=109). Modifiye DISCERN değerlendirmesinde ortalama puan 11,83'tür (min 7, max 35/n=109). Gönderilerin %53'ü (n= 57) ya sadece Protetik ya da kombine tedavilerin protetik işlemleridir. Paylaşımlara en çok "#veneers" etiketi eklenmiştir. Sorularda ise daha çok maliyet, tedavi süresi, randevu oluşturma işlemleri sorulmuştur.

Sonuçlar: Diş beyazlatma ile ilgili Instagram® paylaşımlarının bilgi içerik ve kalitelerinin yetersiz olduğu ve hastaları daha çok girişimsel invaziv tedavi seçeneklerine yönlendirebileceği söylenebilir.

Anahtar Kelimeler: Yanlış Bilgilendirme, Sosyal Medya, Diş Beyazlatma, İnternet, Dental Estetik.

License



This work is licensed under
Creative Commons Attribution
4.0 International License

^a dtmehmetbuldur@gmail.com

^c gizemicerler01@gmail.com



^b <https://orcid.org/0000-0001-9103-0069>



<https://orcid.org/0000-0002-4581-0184>



<https://orcid.org/0000-0003-0019-4872>

How to Cite: Buldur M, Misilli T, Ayan G. (2023) Analyzing Content and Information Quality of Instagram® Posts About #teethwhitening, Cumhuriyet Dental Journal, 26(3):268-275.

Introduction

Today, social media applications play an important role in reaching the information that patients are curious about.¹⁻⁴ Because of patients' refrain from asking face-to-face questions, long waiting times in clinics, and the danger of COVID-19 virus transmission, it becomes more preferable to get medical information over the internet, and this encourages people to research through social media applications.⁵ In many developed countries, most patients do internet research before being examined.⁶ Dentistry has also been affected by this situation. Many patients do internet research about the problems they experience before their dental treatments.⁷ Social media is frequently used to promote dental treatments and share their results.⁸ In addition, patients frequently use social media to ask questions and express their concerns, doubts, and advice, especially about oral and dental health.^{9,10}

Patients would like to have a beautiful smile and also demand to have whiter teeth. They state that they are not satisfied with the normal color of their teeth as well as color changes due to external staining.^{11,12} In studies containing data from many different countries, it was reported that the rate of those who are not satisfied with their tooth color varied between 32.3% and 64.1%.¹³⁻¹⁵ Teeth whitening is one of the most popular cosmetic procedures for patients and can be conducted in the office and/or at home with different materials.¹¹

Instagram®, one of the popular social media applications where visual sharing is dominant, is widely used by patients and physicians.¹⁶ The app has an estimated 1.44 billion monthly users as of December 2022.¹⁷ Users can share different types of posts (photos, videos, etc.) by adding their comments and hashtags (#). They can add up to 30 hashtags (#) to these posts and increase the visibility of their posts by gathering these posts under the same title.

Being able to get information about possible treatments from social media applications, make decisions and receive education on health-related issues provides patients with autonomy.^{18,19} However, the abundance of content in social networking ecosystems causes patients to have difficulty in filtering posts on the subject, which leads to the consumption and production of misinformation and ultimately to the development and dissemination of harmful health information.²⁰⁻²² In the literature, there are studies evaluating the media content on the YouTube™ platform, especially in the field of eliminating aesthetic concerns and teeth whitening.^{23,24} However, there is no study evaluating Instagram® posts under the topic of teeth whitening. This study, in this context, aimed to evaluate the information and general quality of Instagram® images shared with the teeth whitening hashtag (#teethwhitening) for patients.

Material and Methods

A new Instagram® account was created on 10.10.2022 so that the shares to be included in this study would not

be affected by any search algorithms. The first search was made on 14.10.2022. The autocomplete feature of the Instagram® search engine that users frequently search for trending hashtags (#) was utilized. By typing #teeth in the search section, trending tags (#) related to teeth whitening were determined according to the popularity level and in line with the purpose of this study. This procedure was performed 3 times in total, with an interval of two weeks. In each search period, the most popular hashtag (#) was identified as “#teethwhitening” (over 3.5 million), and the study data was completed through the consideration of this hashtag (#).

The first 100 posts shared with the hashtag “#teethwhitening” in each search period were collected in different folders using the Instagram® save feature. In addition, the negative effects of data variability were avoided by taking the screenshots of the shares and the demographic data of the account that shared the information, and the information was fixed. Only posts in English that were open to all users were included in the study. 191 out of 300 posts were not suitable for the research topic; and irrelevant posts (59), posts containing treatments from other areas of dentistry (40), non-English posts (20), identical posts (10), posts with funny content (4), posts with clinical promotion (48), and posts with product promotions (10) were excluded from the study.

The demographic data of the posts included for the study were collected under 2 main headings as account and sharing data. The number of followers of the accounts, their professional information, if any, their contact information and location information were recorded. The method of sharing the post, the treatment method applied, the number of likes, the time (hours) after sharing, the number of comments, and the other top 10 hashtags (#) shared with the post were recorded. The last period information was accepted in the demographic data (likes number, number of comments, number of followers, etc.) of the posts belonging to the same accounts included in the study by entering the first 100 shares in different search periods. In addition, the comments made on the posts were evaluated in terms of the questions that users wondered one month after the last data collection, and the first question in the comment sections of the study posts was recorded.

The posts were evaluated according to the information they contained and their overall quality rating. In addition, the Interaction Coefficient (IC) was determined for each post included in the study: [(Number of Likes + Number of Comments) / Time of posting (hour)]. The content analysis of the posts was performed using the parameters in Table 1, and the scores were determined by two restorative dentistry specialists, M.B. and T.M., using a double-blind evaluation method. In the posts where their scores were different, the evaluators made their decisions by evaluating together. The posts received 1 point for each review item they included, and scores between 0-2 points were considered to be low, scores between 3-5 points were considered to be moderate, and scores between 6-8 points were considered to have a high information level.

In the quality analysis of the shares, the DISCERN guide was used. The DISCERN Guide is used to evaluate the quality and reliability of the material created for the purpose of presenting information in the field of health. In the DISCERN guide, which consists of 3 sections and 16 questions in total, 8 questions in the first part are used to measure the reliability of the information presented, 7 questions in the second part are used to measure the quality of the information given about treatment and care options, and the last question is used to measure the overall evaluation of the sharing. In this research, the questions in the 2nd and 3rd sections of the DISCERN Guide were used (Table 1). Each question was scored between 1 and 5 (1: not suitable, 5: appropriate). A low score in the evaluation indicates low quality, and a high score indicates high quality.^{25,26} Before the DISCERN evaluation, it was determined that there was a positive correlation between the observers by looking at the coefficient of agreement between the physicians. The posts were evaluated by three Restorative Dentistry specialists (M.B., T.M. and G.A.). Since the study was conducted on publicly available data, ethics committee approval was not required.

Statistical Analysis

Test-retests were applied to investigate whether the values re-measured by different people for the same variables were similar or not. Concordance between categorical variables was checked with Kappa statistics, and concordance between continuous variables was checked with Pearson correlations. The interobserver correlation coefficients for the modified DISCERN total score were above the minimum value of 0.70. (W:0.911, $p<0.05$), (W:0.938, $p<0.05$), (W:0.963, $p<0.05$). Statistically significant, positive and very high-level relationships were obtained. In the study, the descriptive statistics (number, percentage, mean, standard deviation, minimum and maximum) of the data were given. As the first step of the statistical analysis, the assumption of normality was checked with the Shapiro Wilk test. In the cases where the normal distribution assumption was not met, the Mann Whitney U test was applied. The Kruskal Wallis test was used to compare the means of three or more groups that did not have a normal distribution. The Post Hoc Bonferroni test was applied to reveal the group or groups that made the difference. The Spearman correlation was used to examine the relationships between the non-normally distributed continuous variables. The analyzes were performed with the IBM SPSS 25 program.

Results

The descriptive statistics of the Instagram® data used in the study are given in Table 2. When the distribution ratios of

the posts are examined, "Dentist" ranked first in occupational groups, "Nano Influencer" in the number of followers, and "Prosthetic Treatment" groups in treatment methods. It was determined that only 1 (one) post received a 'High' score in the information level scale. The most informative topics in the posts were "Explanation" and "Before-After" information. (Figure 1) The number and order of the other hashtags (#) in the posts are as in Figure 2. The number of posts with questions asked in the comment section was determined as 55, and all of the questions were listed in the "Questions" section of the article.

The difference between the IC mean values of the groups formed according to the number of followers was statistically significant ($p<0.05$). Statistically significant differences were obtained between the Nano influencer and Micro and Mid-tier influencer groups. ($p=0.000$ and $p=0.000$). The mean values of the Micro and Mid-tier influencer groups were higher than the mean value of the Nano influencer group. There was no statistically significant difference between the mean of informing content and Modified DISCERN Scores ($p>0.05$), (Table 3).

The difference between the mean IC values in the groups determined according to the treatment methods was statistically significant ($p<0.05$), (Table 3). Statistically significant differences were determined between the Bleaching, Prosthetic and (Orthodontic+Prosthetic) treatment groups ($p=0.003$ and $p=0.015$). The mean scores of the "Prosthetic" and "Orthodontic+Prosthetic" treatment groups were higher than those of the "Bleaching" treatment. A statistically significant difference was found between the mean scores of information ($p<0.05$). Statistically significant differences were determined between the "No info" group and the "Prosthetic", "Combined Treatment" and "Orthodontic+Prosthetic" treatment groups ($p=0.003$, $p=0.011$ and $p=0.007$). The mean values of the "Prosthetic", "Combined Treatment" and "Orthodontic+Prosthetic" treatment groups were higher than those of the "no info" group. A statistically significant difference was obtained between the modified DISCERN Score mean values ($p<0.05$). Statistically significant differences were found between the "no info" group and the "Prosthetics" and "Combined treatment" groups ($p=0.001$ and $p=0.003$). The mean values of the "Prosthetics" and "Combined treatment" groups were higher than the mean values of the no info group (Table 3).

As a result of the Spearman correlation analysis, a statistically significant, positive and high-level relationship was obtained with a correlation coefficient of 0.735 calculated between the Information score and the Modified DISCERN score ($p<0.05$), (Table 4). The same relationship did not exist between the IC and Modified DISCERN Score and the Content Score.

Table 1. Evaluation parameters of Instagram® Posts' Content and Modified Discern Evaluation Questions.

Content Parameters	Modified Discern Questions
Definition	Does it describe how each treatment works?
Indications	Does it describe the benefits of each treatment?
Contraindications	Does it describe the risks of each treatment?
Advantages	Does it describe what would happen if no treatment were used?
Procedures involved	Does it describe how treatment choices affect overall quality of life?
Complications	Is it clear that there may be more than one possible treatment choice?
Prognosis and survival	Based on answers to the above questions, rate the overall quality of the publication as a source of information about treatment choices
Cost	

Questions

1. "How did his teeth end up like it was before??"
2. "We also want to work and study in the USA. How can we go there?"
3. "Does it take a long time to fit that many veneers?"
4. "Are these porcelain or emax?"
5. "What did she do?"
6. "Great work here bro - all milled same day?"
7. "How much did this cost!?"
8. "Great work but - Why? Not necessary at all!!! Great natural teeth before."
9. "How long does the procedure take?"
10. "Is this dangerous?"
11. "If one of my teeth is crooked, do I need to fix it first before getting veneers? I'm assuming I need Invisalign. I had braces for 6 years so they aren't so bad just a little crook on the bottom set."
12. "What does no prep mean?"
13. "What's the aftercare like?"
14. "Expensive?"
15. "Hi, are there any issues if I'm on blood thinners?"
16. "How long does this process take from start to finish?"
17. "How much are your veneers?"
18. "If it's okay with you, could I design you a logo with a cartoon illustration or a new logo?"
19. "How much is this?"
20. "What was done to her teeth?"
21. "What is the cost for just the upper?"
22. "Which lab do you use, doc?"
23. "How far in advance do you need to book an appt?"
24. "How did his teeth end up like it was before??"
25. "How much is something like this?"
26. "How much does this procedures cost?"
27. "I've always wondered why people usually get veneers on their lower teeth?"
28. "What did they do?"
29. "How much does veneers cost?"
30. "How do I organize a consultation?"
31. "Hello I am a graphic designer, do you need any of my services? note - I'm not a bot, kindly check my pages."
32. "We also want to work and study in the USA. How can we go there?"
33. "How to order?"
34. "How much does it cost?"
35. "What's the difference between bonding and veneers?"
36. "Was it too expensive?"
37. "Do you offer non-prep veneers without grinding down your own teeth?"
38. "How long does the procedure take?"
39. "How many visits did this take?"
40. "Looks great! Which color shade are these?"
41. "How many visits did this take?"
42. "Did she get a deep clean on her teeth first??"
43. "Is zoom whitening expensive on its own?"
44. "That sounds really promising, and who wouldn't want whiter teeth?"
45. "Can you do minimal prep veneers that you've seen so many dentists talk about lately? It's always been more appealing to me to get veneers if I don't have to completely ruin my natural teeth?"
46. "How much does veneers cost?"
47. "What color are these? Om3?"
48. "How long does it take to make this?"
49. "Is it painful having them put on?"
50. "What did he do?"
51. "You are so so talented and beautiful! Are you only on tik tok or do you have a YouTube channel? I just found your page, and damn girl!"
52. "I've always wondered why people usually get veneers on their lower teeth?"
53. "That first slide was hideous. Was it infected?"
54. "Do your teeth need to be straightened before you have veneers?"
55. "How much is it per veneers?"

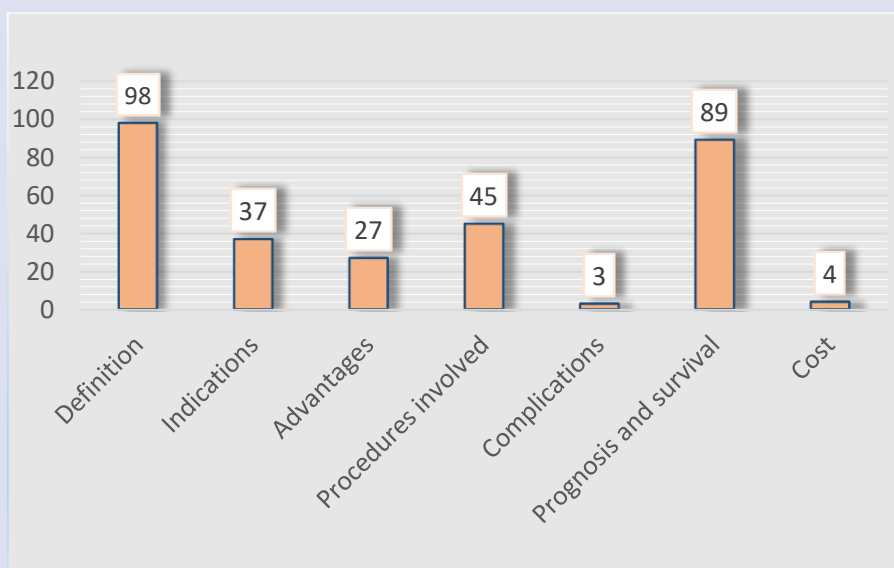


Figure 1: Evaluated Content parameters. (n=109) The numbers indicate the counts of visuals containing the relevant evaluation parameters.

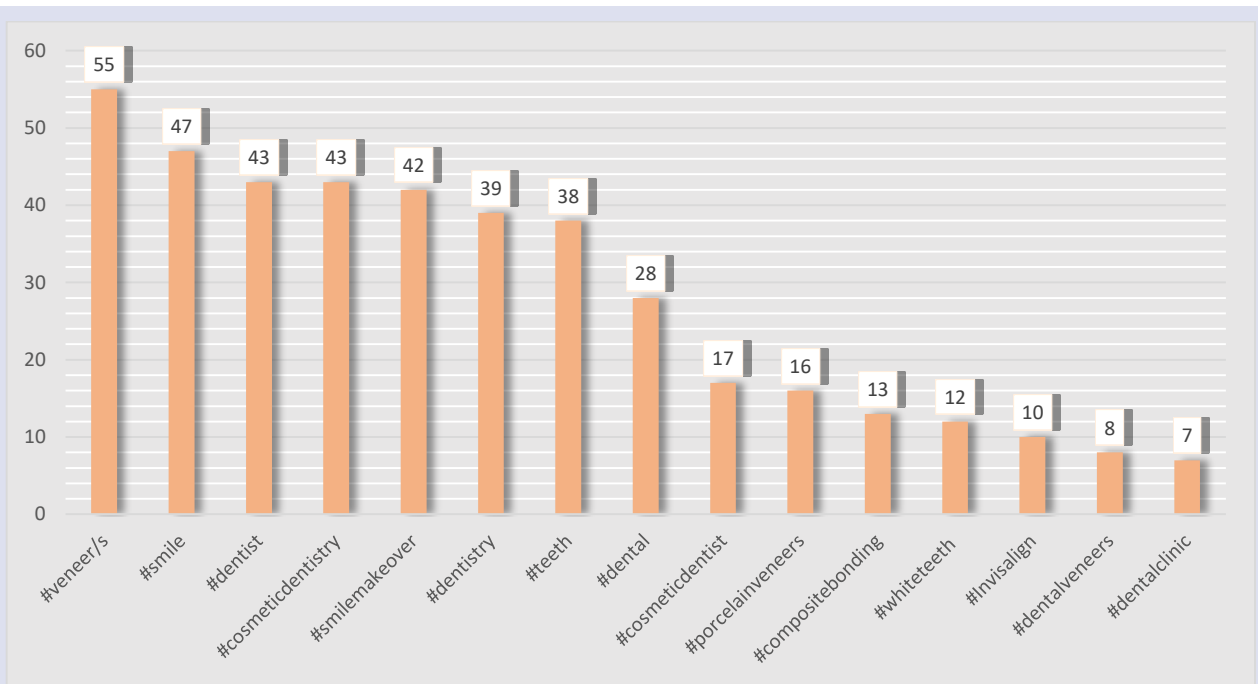


Figure 2: Other mentioned hashtags with #teethwhitening.

Table 2. Demographic distributions by Instagram® account and sharing data.

		n	%		
Source of upload	Dentist	52	47.7		
	Clinic	39	35.8		
	Influencer	5	4.6		
	Cosmetics Industry	13	11.9		
Number of followers	Nano influencer (1.000-10.000)	56	51.4		
	Micro influencer (10.001-50.000)	22	20.2		
	Mid-tier influencer (50.001-500.000)	30	27.5		
	Macro influencer (500.001-1.000.000)	1	0.9		
Treatment method	Prosthetic	40	36.7		
	Whitening	30	27.5		
	Orthodontics and Prosthetics	6	5.5		
	Combined Treatment	6	5.5		
	No information	21	19.3		
Content level	Other	6	5.5		
	0 Point	4	3.7		
	1 Point	13	11.9		
	2 Point	29	26.6		
	3 Point	29	26.6		
	4 Point	26	23.9		
	5 Point	7	6.4		
Content level-group	6 Point	1	0.9		
	Low	46	42.2		
	Moderate	62	56.9		
	High	1	0.9		
	n	Minimum	Maximum	Mean	Standard Deviation
Number of followers	109	75.0	552100.0	37709.11	77067.68
Number of likes	109	0.0	8290.0	932.85	1488.39
Number of comments	109	0.0	232.0	19.35	33.41
Time (hour)	109	1.0	720.0	72.15	120.06
Interaction Coefficient	109	0.0	304.5	27.64	61.13
Modified DISCERN	109	7.0	22.0	11.83	3.77

Table 3. Comparison of Interaction Coefficient, and Content and Modified DISCERN scores according to follower numbers and treatment methods.

	Number of followers	n	Mean	Standard Deviation	Rank Mean	Test Statistic	p
Interaction Coefficient	Nano inf.	56	2.41	2.71	39.20	28.932	0.000*
	Micro inf.	22	40.41	69.73	69.77		
	Mid-tier inf.	31	64.17	85.73	73.06		
DISCERN Score	Nano inf.	56	11.39	3.94	50.44	3.273	0.195
	Micro inf.	22	13.27	4.63	64.50		
	Mid-tier inf.	31	11.61	2.38	56.50		
Content Score	Nano inf.	56	2.66	1.42	52.18	1.294	0.524
	Micro inf.	22	3.00	1.20	60.84		
	Mid-tier inf.	31	2.84	1.04	55.95		
<i>Kruskal Wallis; *p<0.05 Bonferroni; (p=0.00 and p=0.00)</i>							
	Treatment Method	n	Mean	Standard Deviation	Rank Mean	Test Statistic	p
Interaction Coefficient	Prosthetic	40	42.84	74.93	64.80	21.271	0.001*
	Whitening	30	5.52	14.82	36.58		
	Ort.+ Pro.	6	40.46	61.52	83.17		
	Combined Tr.	6	2.29	2.52	41.33		
	No Info	21	40.88	78.48	61.21		
DISCERN Score	Other	6	3.17	3.13	45.50	24.713	0.000*
	Prosthetic	40	13.50	4.11	68.14		
	Whitening	30	10.87	3.03	47.75		
	Ort.+ Pro.	6	12.83	3.37	64.50		
	Combined Tr.	6	15.00	3.29	83.08		
Content Score	No Info	21	9.48	2.27	34.74	29.130	0.000*
	Other	6	9.67	2.88	37.00		
	Prosthetic	40	3.20	1.02	65.86		
	Whitening	30	2.50	1.20	47.02		
	Ort.+ Pro.	6	4.00	0.89	84.83		
	Combined Tr.	6	4.00	1.10	83.00		
	No Info	21	1.90	1.22	35.07		
	Other	6	2.00	1.10	34.42		
<i>Kruskal Wallis; *(p<0.05) Bonferroni; (p=0.003 and p=0.015)</i>							
	Content Score	n	Mean	Standard Deviation	Rank Mean	Test Statistic	p
Interaction Coefficient	Low	46	26.41	70.63	23.50	0.000	0.000*
	Medium	62	29.01	54.04	77.50		
<i>Mann Whitney U; *(p<0.05)</i>							

Table 4. Relationships between Interaction Coefficient, and Content score and Modified DISCERN scores.

		Content Score	DISCERN Score
Interaction Coefficient	Rho	0.135	0.139
	p	0.161	0.148
Content Score	Rho		0.735
	p		0.000*

Spearman correlations; *(p<0.05)

Discussion

Nowadays, the number of patients who would like to have a good smile and shining white teeth is quite high. Patients think that a good smile can make them appear healthier, happier and more attractive. This situation can sometimes give them an advantage even in finding a job.^{24,27} While acknowledging the personal, sociological and psychological benefits of a good smile and shining white teeth, planning treatment procedures completely according to the patient’s wishes is also a very important and controversial issue. The aesthetic treatment

applications that patients would like may not always be necessary and the right choice. Although the treatment plan is usually made by dentists after the examinations of the patient, the patient's expectations are met within the ethical limits. However, there are multiple treatment options/methods for the desired smile and bright white teeth. It has therefore become important that treatment options and planned procedures are carried out by adhering to ethical principles (Primum non nocere).

In a survey conducted among dentists, it was stated that there was an increase in the demands of patients for

aesthetic dental treatments and that the reason for this was social media. It was reported that patients wanted to have “teeth whitening”, “Hollywood smile”, “dental veneers”, and “Invisalign”. This is in line with the data of this study. It was stated that patients requested such procedures because it was a “trend” on social media platforms.^{27,28}

In this study, the accounts in which the images were shared belonged to dentists or clinics at a high rate. In addition, it was determined that laypersons also shared such images. (n=18, % 16,5) In the study of Şimşek *et al.*, in which they examined teeth whitening videos uploaded to the YouTube™ platform, the rate of those sharing from non-professional accounts was stated as 60%.²³ Matheus Lotto *et al.* reported that more than half of the participants were regular people in their Instagram® study on fluoride.²⁹ This rate was lower in this study.

The number of followers of user accounts is a very important factor in reaching the information to different users. The IC used in this study was used to measure the comments and likes received by the posts on an hourly scale. According to the results of the study, the ICs of the accounts with a high number of followers were also high, as expected. However, in quality and content evaluations, the information and content values were low in all of them, without making a comparison between the sub-groups of the number of followers. In the study of Şimşek *et al.*, it was observed that the interaction coefficients of the videos with a low level of information were high, while in this study, the group with a medium level of information score had a higher interaction score than a low level of information.

The purpose of the Instagram® application is not to be an intermediary in presenting right treatment options and methods in health, and not to take responsibility for the correct and high quality of the information and quality of posts. If there are no complaints, the company does not interfere with the posts of users. However, it was also reported by other studies that it could be a direct source of incorrect practices and incomplete information, given the changing conditions of use.^{27,29-32} A similar result was found in this study. According to the information scale, the majority of the shares had insufficient information content. Only 3 posts were informed about possible complications. The situations where the procedures are contraindicated were not mentioned in any of the posts. (Figure 1) In the evaluation made according to the modified DISCERN scoring, the mean value of the posts was only 4 points higher than the lowest score. In the Modified DISCERN evaluation, where the lowest 7 and the highest 35 points can be obtained, only 6 images scored 20 and above, while 45 images scored 10 and below. In the last question of the Modified DISCERN Guide, where the general evaluations of the shares are made, the score of 79 images was below 3.

That almost half of the treatment applications in the posts shared under the #teethwhitening hashtag were either only prosthetic or prosthetic procedures as a step of combined treatments (Periodontology, Orthodontics,

etc.) is the most important issue that can cause misdirections. Prosthetic approaches, one of the most invasive and operational treatment plans required to have white teeth, show that patients demand a general change not only in tooth color but also in tooth morphology and smile design. In a survey with 502 participants, the total rate of patients who were dissatisfied with the color, shape, position of their teeth and their smile in general was 65%.²⁴ This general desire for change may lead both dentists and patients to comprehensive general aesthetic prosthetic procedures involving too many teeth.²⁷ This is also evident from the distribution of other hashtags shared under the study posts, which is another step of the research. The hashtags, which are connected to each other in the interaction network, also refers patients to prosthetic applications or aesthetic and cosmetic areas and to shares that include a comprehensive general change and smile design planning.

In the first questions written under the posts, the users generally wondered about the cost and duration of the process, and how to make an appointment. The most curious issue was the details of the process steps. This was also the case with the low number of posts containing this information in the study. There were also questions such as the durability of the material used, which of the treatment options is good, and which color teeth are made. Only one user emphasized that the operation was unnecessary for a patient who already had natural and beautiful teeth, in order to question the necessity of the operation.

Limitations of the Research

Since this study is a cross-sectional research, evaluations were made within the specified time interval and on a limited number of data. Since the Instagram® platform is a very variable and dynamic platform, information about data may change over time, shares can be deleted by users and new shares can be added. The keyword researched was the most trending teeth whitening hashtag (#teethwhitening) during the study period. The research did not include information about the posts with other hashtags that may be related to the subject. Since only posts in English were taken into account, information about teeth whitening in other languages was not available.

Conclusions

Within the limitations of the study, it can be stated that the information content and quality of the Instagram® posts about teeth whitening were insufficient and may direct patients to more interventional invasive treatment options. Since the normalization of aesthetic perceptions through advanced interventional dental treatments may reveal different health problems in the short, medium and long term, the subject should be supervised by experts in the field. In different dental treatments and other social media applications, patient and dentist communication,

the role of social media in treatment procedures, and demands should be analyzed in detail with further studies.

Acknowledgment

The authors thanks Ayça Ölmez for her contributions to the statistical evaluation also Sercan Hamza Bağlama for the English editing and Sümeyye Kesen and Adem Koçbay senior students of Çanakkale Onsekiz Mart University Faculty of Dentistry, for their contributions.

Conflicts of Interest Statement

The authors have no conflicts of interest to report.

Funding

No funding to declare.

References

- Greene JA, Choudhry NK, Kilabuk E, Shrank WH. Online social networking by patients with diabetes: a qualitative evaluation of communication with Facebook. *J Gen Intern Med.*, 2011;26(3):287-92.
- Al-Silwadi FM, Gill DS, Petrie A, Cunningham SJ. Effect of social media in improving knowledge among patients having fixed appliance orthodontic treatment: A single-center randomized controlled trial. *Am J Orthod Dentofacial Orthop.*, 2015;148(2):231-7.
- Abedin T, Al Mamun M, Lasker MAA, et al. Social Media as a Platform for Information About Diabetes Foot Care: A Study of Facebook Groups. *Can J Diabetes.*, 2017;41(1):97-101.
- Ramkumar PN, Navarro SM, Haerberle HS, et al. Social Media and Total Joint Arthroplasty: An Analysis of Patient Utilization on Instagram. *J Arthroplasty.*, 2017;32(9):2694-2700.
- Gholami-Kordkheili F, Wild V, Strech D. The impact of social media on medical professionalism: a systematic qualitative review of challenges and opportunities. *J Med Internet Res.*, 2013; 28;15(8):e184.
- Kumar N, Pandey A, Venkatraman A, Garg N. Are video sharing web sites a useful source of information on hypertension? *J Am Soc Hypertens.*, 2014;8(7):481-90.
- Ní Riordáin R, McCreary C. Dental patients' use of the Internet. *Br Dent J.*, 2009 19;207(12):583-6; 575.
- Al-Khalifa KS, Al-Swuaiem AS, AlSheikh R, et al. The use of social media for professional purposes among dentists in Saudi Arabia. *BMC Oral Health.*, 2021;12;21(1):26.
- Heavilin N, Gerbert B, Page JE, Gibbs JL. Public health surveillance of dental pain via Twitter. *J Dent Res.*, 2011;90(9):1047-51.
- Graf I, Gerwing H, Hoefler K, et al. Social media and orthodontics: A mixed-methods analysis of orthodontic-related posts on Twitter and Instagram. *Am J Orthod Dentofacial Orthop.*, 2020;158(2):221-228.
- Joiner A, Luo W. Tooth colour and whiteness: A review. *J Dent.*, 2017;67S:S3-S10.
- Herrera A, Martín J, Pérez F, et al. Is personality relevant in the choice of bleaching? *Clin Oral Investig.*, 2016;20(8):2105-2111.
- Montero J, Gómez-Polo C, Santos JA, et al. Contributions of dental colour to the physical attractiveness stereotype. *J Oral Rehabil.*, 2014;41(10):768-82.
- Tin-Oo MM, Saddki N, Hassan N. Factors influencing patient satisfaction with dental appearance and treatments they desire to improve aesthetics. *BMC Oral Health.*, 2011;23;11:6.
- Samorodnitzky-Naveh GR, Geiger SB, Levin L. Patients' satisfaction with dental esthetics. *J Am Dent Assoc.*, 2007;138(6):805-8.
- Graf I, Gerwing H, Hoefler K, et al. Social media and orthodontics: A mixed-methods analysis of orthodontic-related posts on Twitter and Instagram. *Am J Orthod Dentofacial Orthop.*, 2020;158(2):221-228.
- (<https://earthweb.com/how-many-people-use-Instagram/>)
- Tan SS, Goonawardene N. Internet Health Information Seeking and the Patient-Physician Relationship: A Systematic Review. *J Med Internet Res.*, 2017;19;19(1):e9.
- Barber SK, Lam Y, Hodge TM, Pavitt S. Is social media the way to empower patients to share their experiences of dental care? *J Am Dent Assoc.*, 2018;149(6):451-459.e9.
- Giglietto F, Iannelli L, Valeriani A, Rossi L. 'Fake news' is the invention of a liar: how false information circulates within the hybrid news system. *Curr Sociol.*, 2019;08;67(4):625-642.
- Strieder AP, Aguirre PEA, Lotto M, et al. Digital behavior surveillance for monitoring the interests of Google users in amber necklace in different countries. *Int J Paediatr Dent.*, 2019;29(5):603-614.
- Swire-Thompson B, Lazer D. Public Health and Online Misinformation: Challenges and Recommendations. *Annu Rev Public Health.*, 2020;2;41:433-451.
- Simsek H, Buyuk SK, Cetinkaya E, et al. "How I whiten my teeth": YouTube™ as a patient information resource for teeth whitening. *BMC Oral Health.*, 2020 1;20(1):183.
- Zaugg FL, Molinero-Mourelle P, Abou-Ayash S, et al. The influence of age and gender on perception of orofacial esthetics among laypersons in Switzerland. *J Esthet Restor Dent.*, 2022;34(6):959-968.
- 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(2):105-11.
- Discern online. (t.y.). Date of access: 19.02.2023, http://www.discern.org.uk/general_instructions.php.
- Abbasi MS, Lal A, Das G, et al. Impact of Social Media on Aesthetic Dentistry: General Practitioners' Perspectives. *Healthcare (Basel).*, 2022;17;10(10):2055.
- Hebbal MI, Helaby BS, AlHefdhhi MA. Reasons for Widespread Aspiration of Esthetics Veneers "Hollywood Smile": A Survey among Five Gulf Countries. *J Pharm Bioallied Sci.*, 2022;14(Suppl 1):S923-S927.
- Lotto M, Sá Menezes T, Zakir Hussain I, et al. Characterization of False or Misleading Fluoride Content on Instagram: Infodemiology Study. *J Med Internet Res.*, 2022;19;24(5):e37519.
- Basch CH, Milano N, Hillyer GC. An assessment of fluoride related posts on Instagram. *Health Promot Perspect.*, 2019;23;9(1):85-88.
- Guler AY. The effect of Instagram posts related to #Wisdomteeth on patients. *J Stomatol Oral Maxillofac Surg.*, 2022;123(2):155-157.
- Sycinska-Dziarnowska M, Stepień P, Janiszewska-Olszowska J, et al. Analysis of Instagram® Posts Referring to Cleft Lip. *Int J Environ Res Public Health.*, 2020;12;17(20):7404