

The Influence of Social Media on Patients' Preferences of Clear Aligners in Orthodontic Treatment

Sosyal Medyanın, Şeffaf Plak Kullanılmasında Hastaların Tercih Üzerindeki Etkisi

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ABSTRACT

INTRODUCTION: Patients' interest and demand for orthodontic treatment's increased over time. With emergence of various aesthetic concerns with increasing demand, alternatives to traditional bracket orthodontic treatment've been investigated. Effects of increasing popularity of clear aligner treatment on its preference've been wondered. Effect of social media on preference of clear aligner treatment being investigated.

METHODS: Voluntary 18-question questionnaire administered to 193 patients older than 15 years and their relatives who applied to Ege University Department of Orthodontics. Questions related education, sociodemographic status, clear aligner treatment, social-media, and previous orthodontic experiences of patients. Statistical analyses performed with IBM SPSS Statistics 25.0 program and $p=0.05$ determined. Comparison of qualitative variables performed Pearson Chi-square.

RESULTS: 91.7% of participants use social-media, 67.4% of this group uses social-media frequently during day. 61.1% female, 38.9% male. 91.75% of participants heard about clear aligner treatment from social-media. 29% wanted clear aligner treatment applied to them, while rate of those who'd no opinion was 50.8%.

DISCUSSION AND CONCLUSION: There's no significant difference between demand for treatment according gender and use and frequency of social-media and interest in clear aligner treatment. Most of participants're between ages of 17-35. Participants aged 15-35 years more likely to prefer clear aligner treatment. Clear aligner treatment's mostly heard through social-media.

Keywords: Clear aligner, orthodontic treatment, social media, popular treatment, aesthetic treatment

Öz

GİRİŞ ve AMAÇ: Hastaların ortodontik tedaviye olan ilgileri ve talepleri zamanla artmıştır. Artan taleple birlikte çeşitli estetik kaygıların ortaya çıkmasıyla geleneksel braketli ortodontik tedaviye alternatifler araştırılmıştır. Şeffaf plak tedavisindeki artan popüleritenin etkisine bağlı tercih edilmesindeki etkiler merak edilmiştir. Sosyal medyanın, şeffaf plak tedavisinin tercih edilmesindeki etkisi araştırılmaktadır.

YÖNTEM ve GEREÇLER: Ege Üniversitesi Ortodonti Anabilim Dalı'na başvuran 15 yaşından büyük 193 hasta ve hasta yakınlarına gönüllülük esasına dayanan 18 soruluk anket uygulanmıştır. Sorular hastaların; eğitim, sosyodemografik durum, şeffaf plak tedavisi, sosyal medya, geçmiş ortodontik deneyimleriyle ilgilidir. İstatistiksel analizler IBM SPSS Statistics 25.0 programıyla yapılmış, $p=0,05$ belirlenmiştir. Gruplar arasında nitel değişkenlerin karşılaştırılması Pearson Ki-kare'yle gerçekleştirilmiştir.

BULGULAR: Katılımcıların % 91,7'si sosyal medyayı kullanmakta ve bu grubun %67,4'ü sosyal medyayı gün içinde sık sık kullanmaktadır. Katılımcıların %61,1'i kadın, %38,9'u erkektir. %42'si 17 yaş altı, %47,7'si 17-35 yaş aralığında, %9,8'i 36 yaş ve üstüdür. Şeffaf plak tedavisini katılımcıların %91,75'i sosyal medyadan duymuştur. Katılımcıların %29'u şeffaf plak tedavisinin kendilerine uygulanmasını istemekte, fikri olmayanların oranı %50,8'dir.

TARTIŞMA ve SONUÇ: Cinsiyete göre tedaviye olan talep ve sosyal medya kullanımı ve sıklığı ile şeffaf plak tedavisine olan ilgi arasında anlamlı fark görülmemiştir. Katılımcıların çoğu 17-35 yaş arasındadır. 15-35 yaş katılımcılarının, şeffaf plak tedavisini tercih etme eğilimleri daha fazladır. Şeffaf plak tedavisi çoğunlukla sosyal medyadan duyulmuştur.

Anahtar Kelimeler: Şeffaf plak, ortodontik tedavi, sosyal medya, popüler tedavi, estetik tedavi

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INTRODUCTION

Today, the demand of adult patients for orthodontic treatment has increased compared to previous years.¹ Studies have shown that patients find more aesthetic looking orthodontic treatment options acceptable.² Clear aligner treatment, regarded for its enhanced aesthetic appeal, is being considered as an option for patients who are averse to traditional fixed orthodontic appliances.^{3,4} In order to meet these expectations, aesthetic materials and techniques have entered clinical practice.⁵

Clear aligner treatment has been a popular clinical practice since 1998, which has been found to be more aesthetic and comfortable than fixed orthodontic treatment.⁶ It is an easy-to-use treatment that can be worn and removed by the patient. This treatment can be used in mild to moderate crowding, but caution should be exercised in advanced crowding. It is easier to maintain periodontal health of patients treated with clear appliance therapy. White spot lesions, which are seen around the brackets used in traditional fixed orthodontic treatment and are the beginning of caries, are observed less in clear aligner treatment due to the ability to remove the appliances from the mouth during tooth brushing. It causes less pain than fixed orthodontic treatment. With the clear aligner application, the orthodontist's time spent with a patient is reduced and the frequency of appointments is also reduced. Due to such advantages, the interest in clear aligner treatment has recently increased.^{7,8}

At the end of 2015, a literature search revealed that there are 27 different clear aligner brands. In this study conducted by Weir, the differences between the products of the brands are stated.⁹ Putrino et al. conducted a literature search about the clear aligner appliances available in Italy. They used only 9 different brands among 19 different brands in their studies and this study showed that Invisalign clear aligner treatment was the most commonly used product in the studies.¹⁰ It was determined that the most frequently used search term for orthodontic clear appliances was Invisalign.¹¹ Livas et al. analyzed the content on YouTube related to Invisalign treatment. In this study, it was shown that there were sponsored clear aligner reviews.^{12,13}

Developing technologies provide people with various social platforms that enable them to share their thoughts, share ideas, and discuss and evaluate ideas. This virtual environment is called social media. Social media is very important in terms of being user-based, bringing masses and people together and increasing the interaction between them. It shows a rapid rise in terms of usage value, especially among young people.¹⁴ Today, these communication resources are called 'New Media'. The concept of new media was coined in the 1970s by researchers in information and communication-based research, social, psychological, economic, political and

cultural studies. However, the meaning of this term in the 70s has expanded in the 90s with the advancing and developing process in computer and internet technology.¹⁵ Innovations and developments in communication technologies have surprised people in every period. They have kept up with these technological changes and advances, which are called new media, although they are surprised. These changes have become the center of people's lives. People's acceptance of technologies in new media has been much faster than in traditional media because traditional media has prepared the ground for the innovations of new media.¹⁶ The main distinguishing features of the new media, which Lyon describes as "In the late twentieth century, by eliminating the remoteness of space and reducing time", from the traditional media, including newspapers, radio, television and cinema, are that they are in the form of interactive media and multimedia.¹⁷ The internet, also called the general network, is developing over time and its use is spreading. It has become a communication network that covers almost the whole world. Government services, educational and health institutions, companies, media networks and personal computers are connected to each other. New media has been formed as a result of being influenced by these technological developments.¹⁸ Institutions and companies providing health services carry out promotional activities by using communication tools that have become mass with the developing technology. As a result of reasons such as the increase in such institutions and companies, the variety of services and products offered, the increase in patient expectations and knowledge level, and the development of materials and devices used due to technological developments, market conditions have caused them to act with business logic and to see patients as customers.¹⁹

Internet users have started to use social media more to search for health information and share their experiences. Healthcare organizations use social media to disseminate general information about health to prevent diseases.²⁰ Social media has advantages over other media in terms of the speed of updating and sharing information and directing to other sources.²¹ These platforms have been shown to have a beneficial effect on health,²² but recent studies have also shown that misinformation spreads faster on social media than scientific information.^{23,24} The social media environment is changing rapidly every day. This change is covered by research, but it cannot keep up.²⁵ McGowan et al. defined social media as an environment where users can contribute to content and consume content created by other users.²⁶ The effects of social media are highly influential on body image. It also has serious effects on medical practice, research and public health. It is emphasized that consumer interaction, bias, profit-making algorithm and the ways they shape human behavior and health should be examined.²⁷

Patients' expectations from orthodontic treatment are not limited to aesthetics. In a doctoral thesis study involving 453 patients, 93.8% thought that beautiful teeth would improve oral health, 61.8% thought that it would make their school/work life more successful, and 86.1% thought that it would increase their success in social life. Therefore, the desire of patients to receive treatment is influenced by gender, socioeconomic status and the orthodontic treatment experience of their environment.²⁸ Knösel et al. emphasized that YouTube and other social media have a great influence on forming opinions for orthodontic treatment. A significant portion of the user base of social media consists of adolescents. Users can share information and obtain information through social media. In this study, it was also shown that there is a lot of content related to orthodontics on YouTube. Some of these contents were shown to be videos published by patients, while some of them were videos with advertising content uploaded by orthodontists.²⁹ Papadimitriou et al. showed that posts were made on social media about how orthodontic patients feel and psychosocial aspects. In a study consisting of two groups, a group of patients were sent a YouTube video about fixed applications in orthodontics via e-mail and asked to watch it for 3 weeks. After a certain period of time, a questionnaire about this information was sent to the participants. The group that watched the YouTube video scored significantly higher than the other group. As can be understood from this study, presenting information with visual and auditory sources provides improvement in patient information. While the effect of social media on orthodontics is an undeniable fact, it is a question mark whether it has objective content about treatment options. The popularity of clear aligner treatment, which is an aesthetic and comfortable content for orthodontic treatment, has increased in the last decade. In the literature study we conducted to investigate the impact of social media on clear aligners, it was observed that the content of posts about clear aligners shared on social media platforms was analyzed. In a study conducted on Instagram, it was shown that while most of the posts about clear aligners belonged to dentists, 79.8% of them were created by orthodontic specialists. However, it was seen that the posts were mostly promotional and advertising content with untrue information.³²

The effect of the popularization and advertising of clear aligner products used in orthodontic treatment on patients' preference for clear aligner treatment is intriguing. Today, in addition to the increasing interest in clear aligner treatment due to aesthetic and comfort expectations, it causes us to ask the question whether this popularity has an effect. In addition, the influence of social media, which is now widespread almost all over the world, on the decision to choose this treatment option is questioned. Although there are various studies and reviews on clear aligner treatment, there are not enough

studies on other factors that influence patients to choose this treatment other than their aesthetic expectations. Today, the impact of social media used as a marketing, advertising and communication tool is undeniable. Research has shown that social media is one of the best ways to reach potential consumers.³³ It is thought-provoking that patients and patient relatives who use and do not use social media have access to information about clear aligner treatment. It is worth investigating whether characteristics such as sociodemographic status, education level, gender and age of patients who access this treatment option from social media are effective with each other.

The objective of this study is to assess how social media platforms affect patients' decisions when choosing clear aligner treatment. This questionnaire study, which was prepared with various questions, shows the different factors in the preference of clear aligner treatment.

MATERIALS AND METHODS

Approval to conduct this study was obtained from Ege University Medical Research Ethics Committee.

In our study, it was aimed to reach patients and their relatives who applied to Ege University, Faculty of Dentistry, Department of Orthodontics. A questionnaire was used as the research and data collection method. Not all content shared on social media is suitable for children. Social media platforms impose age restrictions to prevent children from being exposed to inappropriate content. Many social media platforms such as Twitter and Instagram have a legal age limit of 13 years. In our study, the age of study was based on the age of 15, which is the pubertal age of boys, since boys enter the pubertal breakthrough period later than girls. Our questionnaires were distributed to 200 patients older than 15 years and their relatives who were randomly selected on a voluntary basis. A total of 193 of the distributed questionnaires were returned and included in our analysis. Patients and their relatives who applied to Ege University Department of Orthodontics or who were younger than 15 years of age were excluded from this study. No funding was used for this survey. Paper-based questionnaires were administered to the participants in the waiting room of the hospital. Participants were given preliminary information about the content and subject of the questionnaire before starting the survey.

The questionnaire consisted of 18 different questions, 5 of which were multiple-choice questions and the remaining 13 were single-choice questions. Of the survey questions, 4 were related to social media, 8 to clear aligners, 3 to orthodontic treatment history, 2 to sociodemographic status, and one to educational status. The individuals participating in the study were accompanied by the survey researchers while filling out the questionnaire. In order for the questions to be

understood, interpreted and answered correctly and completely, no time limit was set for answering the questionnaire in order not to put the individuals participating in the study under stress. The independent variables of the study were the age, socioeconomic and sociocultural levels of the patients. Dependent variables are the treatment interpretation power affected by the independent variables.

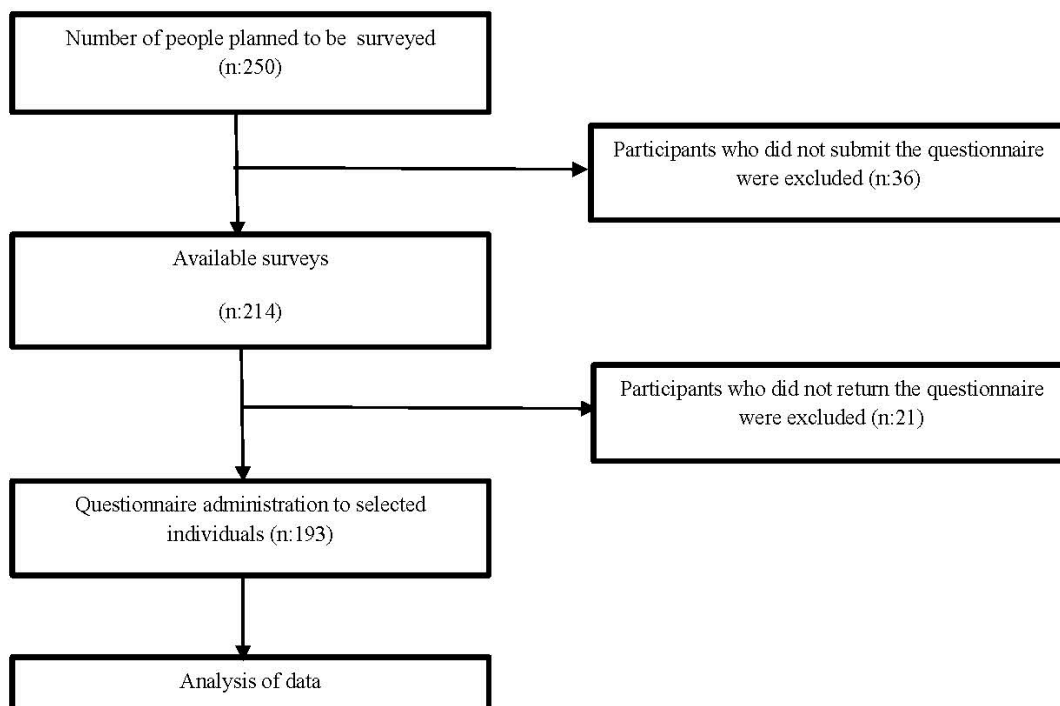
Statistical analyses were performed using IBM SPSS Statistics 25.0 (IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.) package program. The significance level was set as 0.05 in all

analyses. In the study, numerical data were summarized using mean, standard deviation, minimum and maximum values and categorical data were summarized using frequency and percentage values. The assumption of normality in numerical variables was checked with the Shapiro-Wilk test and in parallel with the results, analysis of variance (ANOVA) or Kruskal Wallis test was preferred for the comparison of measurements between the study groups. Pearson correlation coefficients were used for the relationships between quantitative variables. The comparison of qualitative variables between the study groups was performed with Pearson Chi- square.

The Influence of Social Media on Patients' Preferences of Clear Aligners in Orthodontic Treatment
1- Your age: a) Under 17 b) 17-25 c) 26-35 d) 36-49 e) 50+
2- Gender: a) Female b) Male
3- Education status: a) Primary School b) High School c) Bachelor's degree d) Master's degree e) Other
4- Do you use social media? a) Yes b) No
5- How often do you use social media? a) Frequently during the day b) Rarely during the day c) I won't think about it for days d) I do not use social media
6- Which channels do you usually follow on social media? a) My close circle b) Influencer c) Agenda News d) Health News e) Magazine f) Other
7- Have you ever received orthodontic care? a) Yes b) No
8- If you had orthodontic treatment, did you have traditional orthodontic treatment (with brackets)? a) Yes b) No
9- If you have not received orthodontic intervention, do you perceive a need for orthodontic treatment? a) Yes b) No
10- Have you heard of the clear aligner treatment used in orthodontics? a) Yes b) No
11- What is your source of information regarding orthodontic treatment with clear aligners? a) Social media b) From my physician c) From my inner circle

d) From my research e) Not heard f) Other
12- What do you think about orthodontic treatment using a clear aligner? a) More comfortable than bracket (fixed) orthodontic treatment b) Treatment with successful results c) An overrated treatment d) Other
13- Would you like to undergo orthodontic treatment using a clear aligner? a) Yes b) No c) No opinion
14- If you have been treated before, would you like to use clear aligner treatment instead of fixed orthodontic treatment? a) Yes b) No c) No opinion
15- Do you think that clear aligner treatment is as successful as conventional (braced) treatment? a) Yes b) No c) No opinion
16- Do you think orthodontic treatment using a clear aligners is suitable for all patients? a) Yes b) No c) No opinion
17- What factors could potentially motivate your interest in pursuing orthodontic treatment using a clear appliance? a) From what I see on social media, it is a successful treatment b) Due to the positive comments of my close environment c) Because it is aesthetic d) Because of my physician's recommendation
18- What potential rationales exist for your disinclination to pursue orthodontic treatment with the use of a clear aligner? a) Expensive treatment b) My doctor does not recommend c) I don't think it's a successful treatment

Sample questionnaire used in the research



RESULTS

According to the survey results, 61.1% of the participants were female and 38.9% were male. Of the 193 participants, 6.2% had primary school education, 57.5% had high school education, 27.5% had undergraduate education, and 3.1% had graduate education. 42% of the participants were under the age of 17, 47.7% were between the ages of 17-35, and 9.8% were 36 years and older. The question "Do you use social media?" was asked in the survey and 2.1% of the participants did not answer, 91.7% used social media, while 6.2% did not use social media. Among the respondents who use social media, 67.4% stated that they use it frequently during the day, while 26.4% stated that they use it rarely or whenever they think of it. From the survey results, we see that 4.1% do not use social media and 2.1% did not answer this question. While 29% of the participants would like this treatment to be applied to them, 9.8% do not. 50.8% chose the option "no idea", while 10.4% did not answer this question.

Variable (n:193)		Frequency	%
Gender	Female	118	61,1
	Male	75	38,9
Age	Under 17 years	81	42
	17-35	93	47,7
	Over 36 years	19	9,8
Education Status	Primary school	12	6,2
	High school	111	57,5
	Undergraduate	53	27,5
	Master's degree	6	3,1
	Other	11	5,7

When the answers to the question "Would you like this treatment to be applied to you?" were analyzed by educational status, a significant difference was observed in the Chi-square test ($p=0.028$). Patients with bachelor's and master's degrees constituted 30.6% of all participants and 37.3% of this group wanted this treatment to be applied to them, while 21.6% of the 57.5% of participants with high school education answered yes to this question. When the relationship between this question and gender was analyzed, no significant difference was found ($p=0.877$). When the same question was analyzed with age ranges, a significant difference was observed ($p=0.013$). When we examined the questions "Do you use social media?" and "Would you like this treatment to be applied to you?", no significant difference was found ($p=0.694$). No significant difference was found when the frequency of using social media was compared with the willingness to be treated ($p=0.174$).

Among the individuals who participated in our study, 25.9% of those who stated that they had heard of clear aligner treatment before thought that clear aligner treatment was as successful as traditional treatment,

while 46.6% stated that they had no idea which one was more successful between clear aligner treatment and traditional orthodontic treatment. Among the individuals who stated that they use social media, 14% thought that clear aligner treatment was as successful as traditional treatment, while 72.6% stated that they had no idea which one was more successful between clear aligner treatment and traditional orthodontic treatment. While 12.2% of the individuals who stated that they used social media stated that they wanted orthodontic treatment with clear aligner to be applied to them, 57.3% stated that they had no idea about the application of orthodontic treatment with clear aligner to them.

Of the individuals who participated in our survey study, 53.9% had received orthodontic treatment before and 25.3% of these individuals answered 'Yes', 17.9% answered 'No' and 56.8% answered 'No idea' to the question 'If you have received orthodontic treatment, would you like to use clear aligners instead of fixed orthodontic treatment?'

Among the patients who marked that they had heard of clear aligner treatment before, 14% stated that they had heard about clear aligner treatment from social media. More than half of the participants who marked that they use social media frequently during the day did not have a clear idea about the application of clear aligner treatment to them, while 30% wanted clear aligner treatment to be applied to them.

DISCUSSION

Clear aligner treatment has become a popular application and the demand for this application is increasing.^{1,4,6} Based on this popularity, we wanted to examine the factors in the preference of clear appliance treatment. Alalawi et al. showed that social media is an effective way for the dentist to reach the patient.³⁴ In this study, the effect of social media on the preference of clear appliance treatment and the patient profile were examined and the results were shown.

Daenya et al.³⁵ investigated the effect of media advertisements on the quality of orthodontic treatment in patients. According to the study, it was concluded that media advertisements affect patients, but this effect varies among various media such as radio, television, magazines and newspapers.

It has been shown that most internet users access online health information for themselves.³⁶ In our study, the rate of our survey participants who examined health news was 16.6%. Alpaydın et al. showed that web-based information on clear aligner was insufficient.³⁷ Since it is thought that information obtained from social media may affect the treatment process of patients, the content and reliability of videos about clear aligners on YouTube were examined in another study. In this study, it was shown that YouTube users viewed videos related to clear

aligners at a high rate and as a result of the study YouTube was not a reliable source for clear aligner treatment.¹¹

Meade et al. examined the content of posts about clear aligner treatment on TikTok application. It shows that TikTok is a frequently used application by the age group with a high rate of orthodontic treatment.³⁸ Participation in social media is an integral part of the daily life of young people.³⁹ The age group of teenagers and young adults (16, 33) participating in our study was 90.1%. And 67.4% of the participants stated that they frequently used social media during the day.

In the study by Daniel et al. on Twitter analysis of orthodontic experiences of patients with braces and Invisalign, the tweets of patients about their orthodontic treatment process or post-treatment status were shown. It is also seen that there are orthodontic advertisements on Twitter.⁴⁰ Based on the interactions of patients on Twitter, it is predicted that social media affects the decision processes of patients about orthodontic treatment. However, according to the results of our study, there was no significant difference between the use of social media and the preference for clear aligner. The perceptions of potential patients about the professional credibility of orthodontists' posts on social media were analyzed. As the study continued, it became apparent that participants focused on facial images illustrating orthodontic results rather than the technical aspects.⁴¹

In a study by Fabrizia et al., it was shown that most of the patients who underwent clear appliance treatment were women and the information about this treatment was obtained from media advertisements.⁴² In our study, 91.75% of the participants heard about clear aligner treatment from social media. However, no significant difference was found between gender and willingness to have it applied in our study. In the same study, it was shown that young patients' interest in clear appliance treatment increased.⁴² The results of our survey are in line with this idea. It is seen that our participants between the ages of 17-35 are more favorable to the application of clear aligner treatment compared to other age groups.

Based on the statistical analysis of the survey results, a significant difference was found between the education and age of the participants who wanted to see the clear aligner treatment. With increasing age, they are more willing to have this treatment applied to them. As the age of the individuals increases, their interest and desire for clear aligner treatment increases. As the education level of the individuals participating in the study increased, their interest in clear aligner treatment increased and their willingness to have it applied to them increased. The increase in adult patients who seek orthodontic treatment to improve aesthetic and functional function⁴³ confirms this result.

The sample of this study included only patients over the age of 15 and their relatives who applied to Ege University Department of Orthodontics. Participants

aged 36 years and older had a larger sample size than those aged 15-35 years. Although there is no significant difference between social media use according to the age of the participants, participants between the ages of 15-35 have a higher preference for clear aligner than other age groups. The strengths of this study are the demonstration of the effect of education and age on the preference for clear aligner treatment. There is a lack of information on the preference of clear aligner treatment and education status in the studies conducted so far. This study we conducted closes this lack of information and a significant difference was found between them. The results of the study show a contradiction in terms of gender compared to other studies.^{42,43} There was no significant difference between male and female participants in their preference for clear aligner treatment. In this study, it was shown that the majority of the participants heard about clear aligner treatment from social media. However, there is no significant difference between the frequency of using and using social media and the preference of clear aligner treatment. The individuals participating in the study were asked to complete the questionnaire without time limitations in order to fully and correctly understand and answer the questions, regardless of their perception time by comparing two specific options.

This result contradicts the result predicted based on other studies on media. future studies, including patients in private practices and dental faculties of private universities will enlarge the sample and provide an opportunity to expand the perspective of the study. In addition, it would be valuable to examine the effect of social media on applications such as Instagram and YouTube in the next studies in order to provide accurate information to orthodontic patients on the platform, which is thought to have a significantly high effect in the future.

CONCLUSION

- Young adult (15-35) participants were more likely to prefer clear aligner treatment.
 - Clear aligner treatment demand exhibits a positive correlation with higher levels of education.
- There was no significant difference in the preference of clear aligner treatment with gender.
- Most of the participants heard about the clear aligner treatment from social media.
 - There was no significant difference between the use of social media and the frequency of use and the preference for clear aligner treatment.
 - Although more than half of the individuals participating in the study had undergone conventional orthodontic treatment, more than half of this group had no opinion about their preference for orthodontic treatment with a clear aligner.

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