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PROCENA ESTETIKE OSMEHA I RAZLIČITIH TIPOVA PROFILA LICA

ASSESSMENT OF SMILE ESTHETICS AND VARIOUS TYPES OF FACE PROFILES

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Sazetak

Uvod: Nesavršen osmeđ i profil lica nešto su zbog čega se pacijenti najčešće obraćaju ortodontima.

Cilj sprovedenog istraživanja je utvrditi da li postoji razlika u proceni estetike osmeđa i profila od strane različitih ispitivanih grupa.

Materijal i metod: U okviru sprovedenog istraživanja, 15 ortodonta, 15 studenata završne godine stomatologije i 15 osoba van stomatološke struke ocenjivalo je osmeđ 21 osobe (8 osoba muškog i 13 osoba ženskog pola) starosti od 18 do 30 godina. Od ispitivanika je zahtevano da ponudene osmeđe ocene brojevima od 1 do 9 i da za svaki osmeđ zaokruže jedan od ponuđenih faktora koji u najvećoj meri narušavaju estetiku osmeđa. Ortodonti i osobe van stomatološke struke takođe su ocenjivali pravilan, bimaksilarno retrognat i bimaksilarno prognat iste osobe, muškog i ženskog pola, ocenama od 1 do 3, pri čemu je ocenom 3 označavan najlepši profil.

Rezultati: Iako ne postoji statistički značajna razlika u prosečnoj oceni estetike osmeđa od strane svih ispitivanih grupa, osobe van stomatološke struke dale su najnižu prosečnu ocenu. Sve ispitivane grupe su, poređ nepravilnosti pojedinih zuba, navele različite faktore koji narušavaju estetiku osmeđa. Ortodonti i osobe van stomatološke struke, kao najlošiji navode bimaksilarno prognat profil.

Zaključak: Zbog razlika u proceni estetike osmeđa i profila lica od strane ortodonta i pacijenata, potrebno je napraviti estetski protokol za dijagnozu i plan terapije, pri čemu treba uzeti u obzir i studije koje se bave procenom estetike osmeđa i lica od strane pacijenata.

Ključne reči: osmeđ, profil, estetika, procena

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Abstract

Background: Imperfect smile and face profile is one of the main reasons why patients turn to orthodontists.

Aim was to investigate if there is a difference in perception of smile and profile esthetics between the examined groups.

Subjects and method: In conducted research, smiles of 21 persons (8 male and 13 female), 18 to 30 years old were evaluated by 15 orthodontists, 15 students of dentistry and 15 laypeople. They were to rate esthetics of every smile from 1 to 9 and choose just one main reason that impairs aesthetics. Orthodontists and laypeople should also evaluate male and female normal, bimaxillary prognathic and bimaxillary retrognathic profiles from 1 to 3. The most beautiful profile should be marked with number 3.

Results: Although there was no statistically significant difference in the evaluation of smile esthetics among groups, laypeople gave the lowest evaluation. Apart from irregular position of certain teeth, all investigated groups emphasized different factors that impair smile esthetics. Orthodontists and laypeople marked bimaxillary prognathic male and female profile as less beautiful than the others.

Conclusion: Because of the differences in perception of the smile aesthetics between orthodontists and laypeople, it is necessary to create a new diagnostic plan of treatment protocols that includes studies investigating laypeople perception of smile and facial esthetics.

Keywords: smile, profile, esthetics, perception

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Uvod

Lepota osmeha u velikoj meri utiče na lepotu lica.

Nesavršen osmeh je nešto zbog čega se pacijenti najčešće obraćaju ortodontima¹. Doživljaj lepote je subjektivna stvar, koja zavisi o starosti, polu, rase, obrazovanju, iskustvu, ali i uticaju okoline i medija².

Dugo postoji tendencija da se matematički ili geometrijski definiše idealan osmeh. Postoјi mnogo radova koji se bave ovom temom^{3,4}. Pitanje lepote lica, profila i analiza osmeha deo su svakodnevnog rada ortodonta. Ova analiza podrazumeva procenu veličine i boje zuba, vidljivosti gingive, proporcionalnosti zuba, odnosa sredine lica i zubnih nizova, kao i prisustva bukalnih koridora. Na osnovu te analize se, između ostalog, i utvrđuju smernice ortodontske terapije.

U okviru planiranja ortodontske terapije, jako je važno na koji način sam pacijent sagledava svoj problem. Imajući u vidu da su obrazovanje i iskustvo važni faktori koji utiču na procenu lepote, moguće je da ortodonti i njihovi pacijenti ne vide podjednako stvari, pa nemaju ni ista očekivanja od terapije. Pitanje u kojoj meri specijalističko obrazovanje ortodonta utiče na procenu lepote osmeha i lica moglo bi se razjasniti poređenjem procene lepote od strane ortodonta i studenata završne godine stomatološkog fakulteta. Na ovu temu nema mnogo radova u savremenoj literaturi.

Cilj sprovedenog istraživanja je utvrditi da li postoji razlika u proceni estetike osmeha i estetike profila lica između ortodonta, studenata stomatologije i osoba koje su van stomatološke struke.

Ispitanici i metod

U okviru sprovedenog istraživanja, analiziran je osmeh 21 osobe bele rase (8 osoba muškog i 13 osoba ženskog pola) starosti od 18 do 30 godina. Sve osobe koje su učestvovali u studiji detaljno su informisane o tipu istraživanja i potpisale su pristanak i informacioni dokument.

U studiju nisu uključivane osobe koje su podvrgnute ortodontskom tretmanu, osobe sa dentofacialnim deformitetima, kao i osobe sa protetskim radovima.

Za analizu osmeha i profila korišćene su standardizovane frontalne i profilne fotografije. Sve fotografije slikane su Panasonic fotoparatom DMC 27 na standardizованoj beloj pozadini. Pri fotografisanju, od pacijenata je zahtevano da sede i gledaju pravo ispred sebe.

Introduction

The beauty of a smile influences the beauty of one's face to a great extent.

Imperfect smile is one of the main reasons why patients turn to orthodontists¹. Perception of beauty is individual and depends on age, gender, race, education, experience, environment and media².

There is a growing tendency to define a perfect smile both mathematically and geometrically.^{3,4} A great number of papers deal with this topic^{3,4}. The question of the beauty of a face, facial profile and the analysis of a smile represent an integral part of everyday work of every orthodontist. This analysis includes the evaluation of tooth size and color, the visibility of the gingiva, teeth proportionality, the relation between facial and dental midline as well as the presence of buccal corridors. The course of an orthodontic treatment is determined based on this analysis.

Within the process of planning an orthodontic treatment, it is important to know how the patient perceives the problem. Having in mind that education and experience are the key factors which influence the estimation of beauty, it is possible that an orthodontist and a patient do not perceive things in the same manner and therefore have different expectations in terms of a therapy. To what degree the expert knowledge of orthodontists influences the evaluation of beauty could be clarified by the comparison of beauty assessment of orthodontists and final-year students at the Faculty of Dentistry. There are not a lot of papers on this topic in modern literature.

The aim of this research is to determine whether or not there are any differences in the evaluation of a smile and facial aesthetics between orthodontist, dental students and people who do not have expertise in this field (laypeople).

Subjects and methods

The sample comprised 21 smiles of white people (8 males and 13 females) 18 to 30 years of age. All the people who participated in the study were informed about the type of the research in detail and have signed the document of consent.

People who were undergoing any orthodontic treatment, people with dentofacial deformity, as well as those with prosthetic works were not included in this study.

Standardized frontal and ophthalmic photographs were used for the smile analysis. All the photographs were taken by Panasonic camera DMC 27 in front of the standardized white background.

Fotografije namenjene analizi osmeha zatim su isećene, tako da je ostao donji sprat lica, koji uključuje osmeh (slika1).



Slika 1. Fotografije osmeha
Figure 1. Photos of a smile

Od ispitanika je zahtevano da ponuđene fotografije ocene brojevima od 1 do 9. Ocene od 1 do 3 predstavljaju estetski neprihvatljiv osmeh, od 4 do 6 estetski prihvatljiv osmeh, dok ocene od 7 do 9 predstavljaju lep osmeh. Ispitanici su takođe, za sve fotografije, zaokruživali jedan od ponuđenih razloga ispod svake fotografije, za koji smatraju da je u najvećoj meri odgovoran za naruševanje estetike osmeha.

Fotografije su ocenjivane od strane 15 ortodonta, 15 studenata završne godine stomatologije i 15 osoba van stomatološke struke. Nakon sakupljanja, rezultati su prosleđeni na dalju statističku analizu. Utvrđivane su srednje vrednosti ocena u svakoj ispitivačkoj grupi. Rezultati su obrađeni Bonferroni testom, kako bi utvrdili postojanje razlika među ispitivanim grupama. Rezultati koji se tiču određivanja glavnih faktora koji narušavaju osmehe su, takođe, opisani.

U okviru drugog dela istraživanja, 15 ortodonta i 15 osoba van stomatološke struke ocenjivalo je, na skali od 1 do 3, lepotu pravilnog, bimaksilarnih retrognatih i bimaksilarnih prognatih muških i ženskih profila lica.

Odradene su standardizovane fotografije idealnog profila osoba muškog i ženskog pola. Pravilan profil određivan je na osnovu estetske Z linije. Ova linija dodiruje najistureniju tačku brade i najistureniju tačku usne, i kod idealnog profila seće vrh nosa. Fotografije su potom obrađene u photoshopu, tako da smo dobili bimaksilarno retrognat i bimaksilarno prognat profil za svaku osobu (slika 2).

The selected photographs were cropped so there remained the lower part of a face with a smile (Figure 1).

The respondents were asked to assess the photographs with numbers from 1 to 9. Marks 1-3 represented aesthetically unacceptable smile, 4-6 aesthetically acceptable smile, while 7-9 a beautiful smile. The respondents also circled one of the given answers to the reasons which mostly impair the aesthetics of a smile.

The photographs were evaluated by 15 orthodontists, 15 final-year dental students and 15 laypeople. Collected data were further statistically analyzed. Mean values were determined for each study group. In order to determine the existence of differences among the studied groups, the received results were analyzed by means of Bonferroni test. Results which referred to the main factors which impair a smile were also described.

Within the second part of the research, 15 orthodontists and 15 laypeople evaluated the beauty of balanced, bimaxillary retrognathic (BMR) and bimaxillary prognathic (BMP) male and female facial profile with the numbers from 1 to 3.

Standardized photographs of ideal male and female facial profile were taken and developed. Regular profile was determined according to an aesthetic Z line. This line reaches the most prominent point of the chin and the most prominent lip and in ideal profile cuts through the tip of the nose. The photographs were then processed in photo shop and we got bimaxillary retrognathic and bimaxillary prognathic profile of each (Figure 2).



Slika 2. (A) pravilan profil (B) bimaksilarno retrognat (C) bimaksilarno prognat profil
Figure 2. (A) regular profile (B) bimaxillary retrognathic profile (C) bimaxillary prognathic profile

Rezultati

Rezultati sprovedene studije ukazuju na to da ne postoji statistički značajna razlika u oceni estetike ponuđenih osmeha od strane ortodonta, studenata stomatologije i osoba van stomatološke struke (Tabela 1).

Bonferroni test pokazao je da ne postoji statistički značajna razlika između ocene estetike osmeha brojevima od 1 do 9, koju su dali ortodonti i osobe van stomatološke struke ($p=0,89$), ortodonti i studenti ($p=0,58$) i studenti i osobe van stomatološke struke ($p=0,60$).

Što se tiče pronalaženja konkretnih razloga za remećenje estetike ponuđenih osmeha, rezultati ukazuju na razlike između ispitivanih grupa (grafikoni 1, 2 i 3).

Orthodonti, kao i osobe van stomatološke struke, ocenjuju bimaksilarno prognat profil kao estetski najneprihvatljiviji. Za razliku od ortodonta, osobe van stomatološke struke nisu u stanju da razlikuju pravilan profil od bimaksilarno retrognatog profila i smatraju ih približno atraktivnim (grafikon 4).

The obtained results suggested that there was no statistically significant difference in the evaluation of the aesthetics of the given smiles made by orthodontists, students of dentistry and laypeople (Table 1).

Bonferroni test showed that there was no statistically significant difference between the orthodontists and laypeople ($p=0.89$), orthodontists and students ($p=0.58$) students and laypeople ($p=0.60$) in terms of their evaluation of the aesthetics of a smile with the numbers from 1 to 9.

As far as finding the concrete reasons which impair the given smiles, the results showed that there were differences among the examined groups (Graph. 1, 2 and 3).

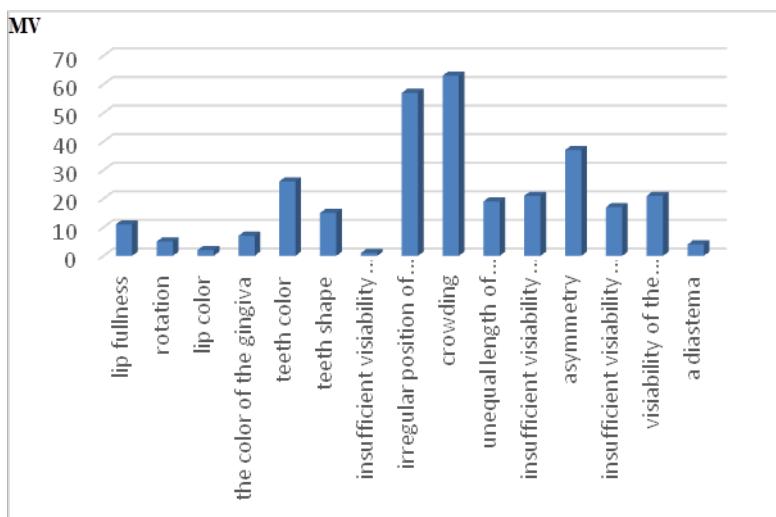
Orthodontists as well as laypeople assessed bimaxillary prognathic profile as aesthetically most unacceptable. Unlike orthodontists, laypeople were not able to make difference between regular and bimaxillary retrognathic profiles and considered them both approximately attractive (Graph. 4).

Results

Tabela 1. Vrednosti dobijene deskriptivnom statističkom analizom (srednja vrednost, standardna devijacija), koje se tiču subjektivne ocene estetike osmeha

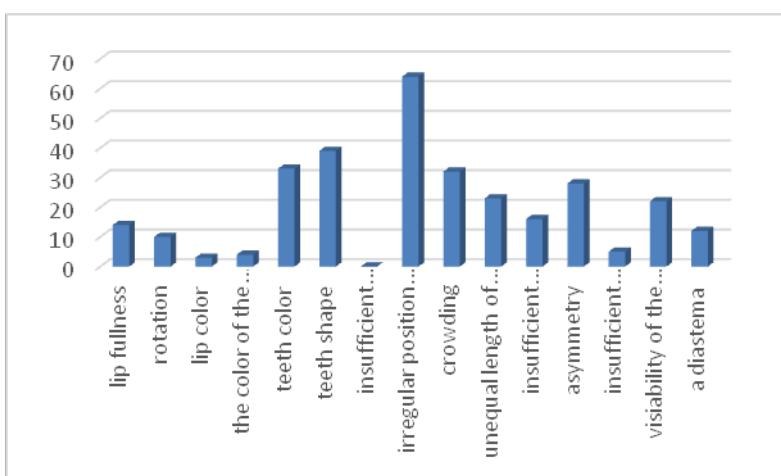
Table 1. Values obtained by the descriptive statistical analysis (mean values, standard deviation) which are concerned with the subjective evaluation of smile aesthetics

	ortodonti orthodontists	studenti students	osobe van stomatološke struke laypeople
Srednja vrednost Mean value	5,1	5,15	4,86
SD MV	2,17	2,12	2,47



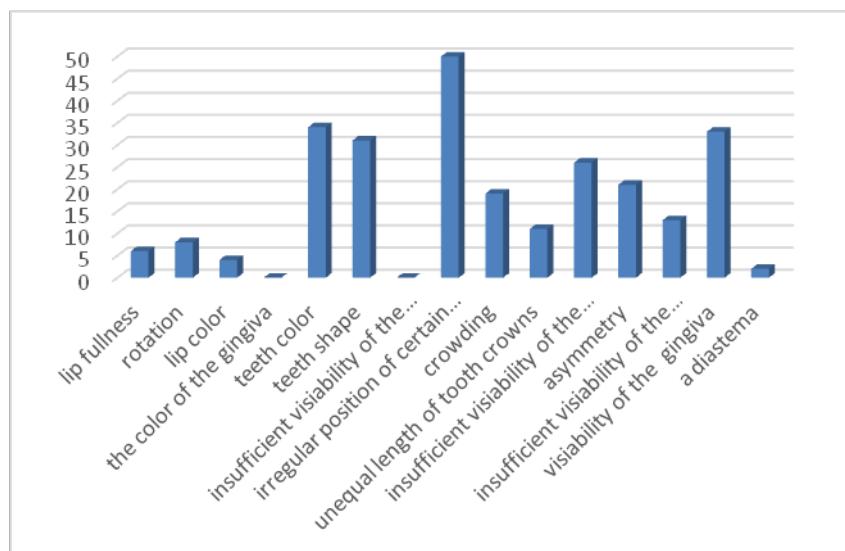
Grafikon 1. Prevalencija faktora koje su ortodonti navodili kao glavne razloge za remećenje estetike ponuđenih osmeha

Graph. 1. The prevalence of factors that the orthodontists listed as the main reasons which impair the aesthetics of given smiles



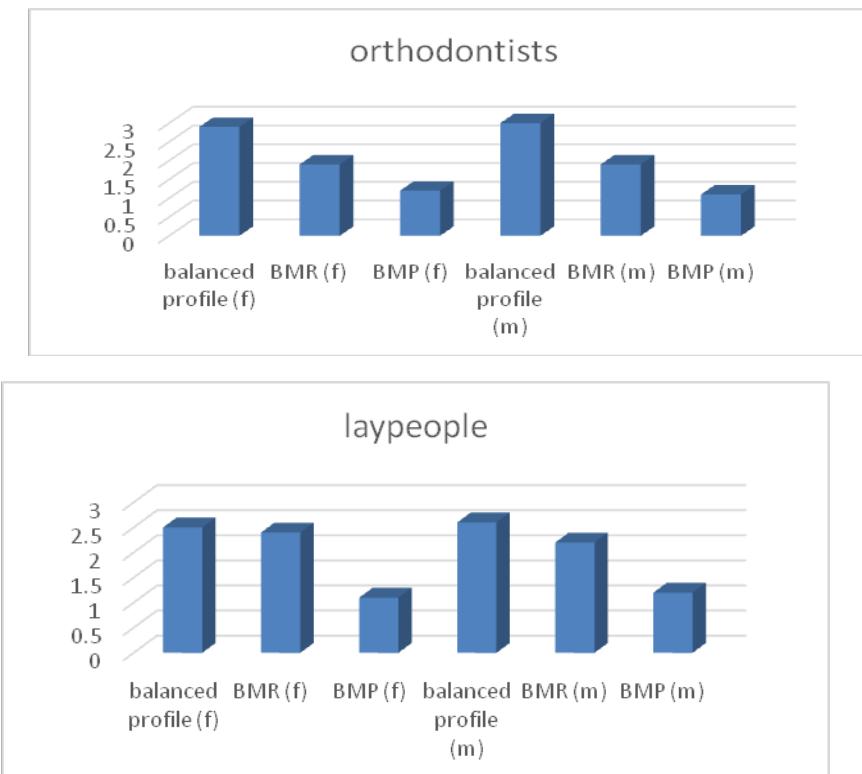
Grafikon 2. Prevalencija faktora koje su studenti navodili kao glavne razloge za remećenje estetike ponuđenih osmeha

Graph. 2. The prevalence of factors which the students listed as the main reasons which impair the aesthetics of given smiles



Grafikon 3. Prevalencija faktora koje su osobe van stomatološke struke navodile kao glavne razloge za remećenje estetike ponuđenih osmeha

Graph. 3. The prevalence of factors which the laypeople listed as the main reasons which impair the aesthetics of given smiles



Grafikon 4. Prosečne ocene estetike pravilnog, bimaksilarno retrognatog (BMR) i bimaksilarno prognatog (BMP) muškog i ženskog profila, od strane ortodonta i osoba van stomatološke struke

Graph. 4. Average mark of a regular, bimaxillary retrognathic (BMR) and bimaxillary prognathic (BMP) male and female profile by orthodontists and laypeople

Diskusija

U sprovedenoj studiji, ocene estetike osmeha u svim ispitivanim grupama blizu su broja 5, što znači da je najveći broj osmeha, sa ponuđene liste, označen kao estetski prihvatljiv. Ne postoji značajna statistička razlika u oceni estetike osmeha od strane ispitivanih grupa. Ipak osobe van stomatološke struke dale su najmanju prosečnu ocenu. To znači da su osobe koje su van stomatološke struke, i najčešće naši pacijenti, nešto oštije u proceni estetike osmeha.

Svaka grupa ispitanika sagledala je osmehe iz svog ugla, naglašavajući različite nedostatke kao glavne uzročnike kvarenja estetike osmeha.

Iz ugla ortodonta, teskoba, asimetrija osmeha i nepravilan položaj pojedinih zuba glavni su uzročnici remećenje estetike osmeha, dok osobe van stomatološke struke, pored nepravilnog položaja zuba, naglašavaju vidljivost gingive i boju zuba, kao glavne uzročnike remećenja estetike osmeha. Studenti završne godine stomatologije, pored nepravilnog položaja pojedinih zuba, navode boju i oblik zuba, kao faktore koji u najvećoj meri remete estetiku osmeha.

Na osnovu dobijenih rezultata, možemo zaključiti da je lepota stvar subjektivne procene i da je, zbog razlika u percepciji estetike od strane ortodonta i pacijenata, potrebno napraviti estetski protokol za dijagnozu i plan terapije, pri čemu treba uzeti u obzir i studije koje se bave percepcijom estetike osmeha i lica od strane pacijenata.

Rezultati takođe pokazuju na to da specijalističko ortodontsko znanje menja percepciju estetike osmeha u odnosu na studente stomatologije, koji su približniji ljudima van stomatološke struke, u pogledu označavanja konkretnih nepravilnosti koje remete estetiku osmeha.

Svakako je poželjno, pre početka terapije, detaljno informisati pacijenta o tome šta se može postići, kao i detaljno ispitati pacijenta o tome šta za njega predstavlja glavni estetski problem zbog koga želi ortodontsku terapiju.

U dostupnoj literaturi nema mnogo radova na temu procene estetike osmeha od strane različitih ispitivanih grupa. Cotrim R. i sar.² i Rodrigues i sar.⁵ došli su do zaključka da se ocena estetike osmeha ljudi van stomatološke struke razlikuje od ortodontskih estetskih normi, što se donekle poklapa sa rezultatima našeg istraživanja. U svom istraživanju Van der Geld i sar.⁶ ističu da su vidljivost cele krune sekutića, kao i umerena

Discussion

In the conducted study, marks used for the evaluation of smile aesthetics in all the groups is close to number 5 which means that the majority of given smiles is marked as aesthetically acceptable. There is no statistically significant difference in the evaluation of the aesthetics of a smile between the groups, however the group consisting of laypeople gave the lowest average mark. This means that people who do not have expertise in dentistry, and who are most often our patients, are harsher in the assessment of the aesthetics of a smile.

Each group of respondents saw smiles from their perspective and stressed out various imperfections as main causes that impair the aesthetics of a smile.

From a standpoint of an orthodontist, crowding, asymmetry and irregular position of teeth are the main causes that impair the aesthetics of a smile, while laypeople apart from irregular teeth position stress out the visibility of the gingiva and teeth color. Besides the irregular teeth position, students also identify teeth color and shape as the key factors which impair the aesthetics of a smile.

Based on the obtained results we can conclude that beauty is a matter of a subjective assessment and should keep in mind that because of the differences in the aesthetic perception of orthodontists and patients there is a need for an aesthetic protocol for making the diagnosis and a plan of treatment, taking into consideration studies which deal with the aesthetic perception of a smile and face by patients as well.

The results also show that orthodontic knowledge changes the perception of smile aesthetics in comparison with the students of dentistry who are more similar to laypeople in terms of stating the facts that impair smile aesthetics.

It is necessary to inform the patient about what it is possible to achieve in detail before the treatment as well as ask the patient what the main aesthetic problem is and at the same time the reason why he or she wants to undergo an orthodontic treatment.

There are not a lot of papers on the aesthetics of a smile from the viewpoint of different groups of people in the literature, Cotrim R et al.² and Rodrigues C de D et al.⁵ came to the conclusion that the assessment of

vidljivost gingive pri osmehu poželjni i estetski privlačni faktori, što se ne poklapa sa našim rezultatima, s obzirom na to da ispitivane osobe van stomatološke struke navode vidljivost gingive kao jedan od tri glavna faktora koji remete estetiku osmeha. Ova činjenica još jedan je u nizu dokaza da ortodonti i osobe koje su van stomatološke struke različito gledaju na estetiku osmeha.

Evidentna je i razlika u proceni estetike profila između ispitanika pomenutih grupa. Osobe van stomatološke struke ne uočavaju razliku između pravilnog i retrognatog profila. Pomenuti rezultati poklapaju se sa rezultatima Falkensammer F. i sar.⁷, koji ističu to da i ortodonti i maksilofacijalni hirurzi drugačije percipiraju lepotu lica u odnosu na osobe van stomatološke struke. Sa druge strane I. Manevska i sar.⁸ navode konkavni profil kao estetski najneprihvatljiviji, što se ne poklapa sa našim rezultatima.

Zaključak

- Najoštrije u proceni estetike osmeha su osobe van stomatološke struke, iako nije pronađena značajna statistička razlika u ocenama između ispitivanih grupa.
- Ortodonti navode da pored nepravilnosti pojedinih zuba, teskoba i asimetrija osmeha u velikoj meri remete estetiku osmeha. U svojoj proceni studenti stomatologije bliži su osobama van stomatološke struke nego ortodontima i navode da su oblik i boja zuba jako važan faktor koji remeti estetiku osmeha.
- Zbog razlika u proceni estetike osmeha od strane ortodonta i pacijenata potrebno je napraviti estetski protokol za dijagnozu i plan terapije, pri čemu treba uzeti u obzir i studije koje se bave procenom estetike osmeha i lica od strane pacijenata.
- Ortodonti i osobe van stomatološke struke navode bimaksilarno prognat profil kao etetski najmanje prihvatljiv, što je važan podatak, s obzirom na to da ortodontska terapija može uticati na promenu profila pacijenata.

the aesthetics of a smile by laypeople is not in accordance with orthodontic norms, which is similar to the results of our study to a certain extent.

Van der Geld et al.⁶ point out that the visibility of the whole incisor crown and moderate visibility of the gingiva while smiling are aesthetically desirable which does not coincide with our results, since laypeople in our study state that the visibility of the gingiva is one of the main factors that impair the aesthetics of a smile. This fact is yet another proof that orthodontists and laypeople perceive the aesthetics of a smile differently.

The difference in the assessment of the facial profile aesthetics is evident between the mentioned groups. Laypeople cannot see the difference between a balanced and retrognathic profile. These results coincide with the results of Falkensammer F et al.⁷ who stress out that orthodontists and maxillofacial surgeons perceive the beauty differently from laypeople. On the other hand Manevska I. et al.⁸ define a concave profile as aesthetically least acceptable which does not concur with the results of our study.

Conclusion

- The most severe assessments of the aesthetics of a smile were those done by laypeople even though there was no statistically significant difference between the groups.
- Orthodontists state that besides irregularity of certain teeth, crowding and asymmetry impair the aesthetics of a smile to a great extent. Dental students are closer to laypeople in their evaluation and claim that shape and teeth color represent important factors which undermine the aesthetics of a smile.
- Because of the differences in the aesthetic assessment of orthodontists and patients, it is necessary to establish an aesthetic protocol for making the diagnosis and treatment plan while taking into account studies on aesthetic assessment of a smile and face by patients.
- Orthodontists and laypeople identify the bimaxillary prognathic profile as least acceptable which is an important piece of information having in mind that orthodontic treatment can influence the change in the profile of a patient.

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