

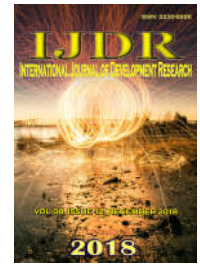


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## STUDY OF THE INFLUENCE OF CULTURAL FACTORS IN THE PERCEPTION OF AESTHETICS IN ODONTOLOGY

Andoh, A., \*Qammous, N., Boujoual, I., Rakkabi, J. and Moussaoui, H.

Department of Fixed Prosthodontics, Faculty of Dental Medicine University Hassan II Casablanca

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### ABSTRACT

**Object:** Evaluation of the influence of cultural parameters in the perception of aesthetics in dentistry. Study of peculiarity or universality in the perception of aesthetics in dentistry. **Material and methods:** A systematic literature search on MEDLINE (Pub Med) electronic databases, Cochrane Library, as well as a manual search gathering cross-sectional studies conducted in different countries, was conducted using 13 keywords through Boolean equations: Dental aesthetic, Smile, Dental appearance, Tooth color, Perception, Attractiveness, Culture, Race, Diastema, Tooth size, Ethnic groups, Teeth alignment, Well aligned teeth, published from the year 2000. **Results:** Articles published from the year 2000 and meeting the eligibility criteria were identified after reading their titles and abstracts. 20 articles have been selected. Five criteria influencing the perception of the smile were studied: the diastema, the size of the teeth, the color the alignment of the teeth, the size of the teeth and the gingival exposure. There is no standard judgment on the aesthetic or unsightly nature of the diastema. Similarly for dental color there is no uniform judgment. The cultural factor does not influence the perception of the smile regarding the "alignment" factor, which remains constant among all the populations studied. The factor "gingival exposure" remains unappreciated in the majority of studies. For the last criteria, we concluded that the preference of the large size of the teeth transcends ethnic factors, sex and professional culture. Society influences our aesthetic judgment. Depending on the culture, the aesthetics of the smile may be different. **Conclusion:** The perception of the smile is influenced by several factors: sex, socio-cultural origins... It can vary from one individual to another, and the judgment of the dentist may not coincide with the patients even between dentists in different specialities. Based on the results of this study, it seems necessary to "individualise" most often the treatments for each patient.

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### INTRODUCTION

Aesthetics and beauty, together with well-being, are now an integral part of health. The teeth and the smile participating in the expression of the face are the privileged place of our physical appearance. The dental aesthetic proposes to recreate a physiological and harmonious smile. For the dentist, recreating a smile in harmony with the face remains a delicate test that depends on his perception of symmetry and asymmetry. The practitioner must grasp the psychological, socio-cultural and professional implications of the patient's approach before addressing the technical aspect of the physical modifications desired or sought.

*\*Corresponding author: Qammous, N.,*  
Department of fixed prosthodontics, Faculty of Dental Medicine University Hassan II Casablanca

In today's media-influenced society, the ideal image is that of a young person with regular features and physical attraction. New artistic trends offer us an advertising smile with perfectly aligned, white, shiny teeth; smile that is often artificial. Media that directly values the image can also contribute to our dissatisfaction. The appearance of the stars or those at the top of the social ladder seems to be a model to follow for others. It should be noted that each individual sets his requirements and desires for beauty according to his culture and fashion. What can be accepted in one culture can be totally rejected in another. In the light of the above-mentioned, it seems essential to carry out a systematic review allowing a thorough analysis as well as a synthesis of the results of a set of studies carried out on this subject. The main objective of our study is to evaluate the influence of cultural parameters in the perception

of aesthetics in dentistry. Our secondary objective was the study of particularity or universality in the perception of aesthetics in dentistry.

## MATERIALS AND METHODS

The literature search relied on Pubmed and Cochrane Library databases; secondly a hand-search was performed by snowballing articles (ascendant search) found by the first search.

The date of the last computer search was 03/04/2018

13 key words were used "dental esthetics", "smile", "dental appearance", "tooth color", "attractiveness", "culture", "race", "diastema", "tooth size", "ethnic groups", "Teeth alignment", "well aligned teeth" and "perception".

These words were used under the following combinations:

- Dental aesthetics AND Smile AND Culture
- Dental appearance AND Tooth color AND Culture
- Perception AND Dental aesthetics AND Culture
- Smile AND Dental Aesthetics AND Attractiveness AND Culture
- Smile attractiveness AND Race
- Race OR Ethnic groups OR Culture AND Tooth color
- Diastema AND Race OR Ethnic groups OR Culture
- Tooth size AND Race OR Ethnic groups OR Culture
- Teeth alignment OR Well aligned teeth AND Race OR Ethnic groups OR Culture
- Tooth color AND Race OR Ethnic groups OR Culture.

After having explored the 2 electronic databases mentioned previously, the bibliographical references of the retained articles were examined to detect other articles following the same path as the present study.

The articles selected are studies that have met the following inclusion criteria: articles in English and French, published from the year 2000, dealing with the perception of the aesthetics of the smile, studies made in countries with different cultures, studies dealing with the perception of the following factors: diastema, tooth color, tooth alignment, tooth size and gum exposure, and studies not mentioning ethnicity or religion.

Articles dealing with other facial or oral aesthetic criteria were excluded.

The assessment of the scientific articles was carried out by 3 authors (A.A, M.H, R.J).

Rachid SALMI's critical article reading charts (2008) were used to screen the level of evidence of each article in a relevant way.

To prepare and structure this systematic review, the targeted question was developed using PICO criteria. (Participants => Evaluators with their variables: age, sex, profession Intervention => Study of the influence of 5 criteria. Comparison => Comparison of the perception of the smile between the different ethnic groups. Outcome results => impact of the criteria on the attractiveness of the smile.

The writing of this work followed the guidelines of The PRISMA Statement "Preferred Reporting Items for Systematic Reviews and Meta-Analyses".

## RESULTS

Initially, 439 studies were found, out of which 39 studies were selected after the first selection based on the reading of titles and abstracts. The second reading yielded 12 articles and through the manual search we obtained 10 articles out of which 2 were rejected. This allowed us to obtain 20 potentially relevant articles, according to the schematic selection process in the form of a data extraction diagram. All of the 20 selected works dealt with the 5 chosen aesthetic criteria and met the eligibility criteria. These are cross-sectional studies by researchers from different countries. 19 are articles in English, 1 work in French. The studies were classified according to the 5 criteria studied and showed that the perception of the aesthetics of the smile of the evaluators belonging to different countries and to different ethnic groups is variable for some criteria and identical for others.

### *Influence of the diastema on the perception of the smile according to the different cultures*

The influence of the diastema on the attractiveness of the smile was evaluated in 8 cross-sectional studies. Studies conducted in Saudi Arabia, Dubai, Morocco, Brazil, Canada / USA and the United States among an Afro-American population have concluded that the presence of a diastema in a smile, regardless of its width, is judged not attractive to all participants according to the analysis of the tolerance limit.

For the team of Mokhtar *et al.*, it is necessary to treat the diastema. The study by Saunders *et al.* conducted on an elderly African-American population and comparing it with another study previously completed by Holtzman in 1999 among older Caucasians, found that diastema is the least aesthetic criterion in comparison with older adults. Other criteria studied (intact teeth, fractured teeth, missing teeth, crown teeth). However, in the study by Al Shahrani *et al.*, a minority of Saudi students consider the diastema to be a sign of beauty. Similarly, the multi-ethnic study in Nigeria by Akinboboye *et al.* demonstrated that the presence of the diastema is acceptable and that a width of 2 to 3 mm is considered aesthetic. The presence of diastema becomes unpleasant when it exceeds 4 mm. In addition, the study by Rosentiel *et al.* found that there is a significant difference in diastema assessment between black and white ethnic groups.

### *Influence of the color on the perception of the smile according to the different cultures:*

The impact of color on the perception of the smile has been studied in 8 articles. Regarding the validity of this parameter, most studies have shown that color is the most important aesthetic criterion and has a significant influence on the perception of the aesthetics of the smile. The study by Muller *et al.*, carried out in Côte d'Ivoire, reported that 51 cases or 20.56% of smile genetic factor are related to color. They also found that executives and students have the highest percentages of satisfied individuals.

The study conducted by El Zarea *et al.*, conducted in Saudi Arabia, showed that 65.9% of participants are dissatisfied with the color of their teeth and the majority want to have a tooth bleaching. The study by Niaz *et al.*, conducted in the United Kingdom, of which 55% of the students identified themselves as white / Caucasian, 10% of British blacks, 26.7% of British

Asians and 8.3% others, found that % of participants prefer a light shade. No one chose the medium or yellowish hue. The Boeira *et al.* Study, conducted in Brazil, found that 70.6% of participants are satisfied with the color of their teeth. While the study by the team of Lanjert *et al.*, in Croatia, interesting Caucasians, showed that 43% of patients are satisfied with the color of their teeth. The study by Rosentiel *et al.*, in the United States and Canada, found that 21.6% of participants prefer white teeth, while 13.3% of participants prefer a natural shade. A single study by Cotrim *et al.*, conducted in Brazil comparing perception between the professional and nonprofessional group, found a lack of significant difference in perception between groups and reported that tooth color is the most criticized factor by general dentists. The study by Rehman *et al.*, in Pakistan, found that fair skin in combination with white teeth is perceived as the most attractive female smile and that light skin with moderately white teeth is perceived as the male most attractive smile. The ethnic factor was mentioned in 2 studies. Niaz *et al.* in the United Kingdom and Rosentiel *et al.* in the United States and Canada have shown that there is no significant relationship between ethnicity and satisfaction of dental appearance.

***Influence of the alignment of the teeth on the perception of the smile according to the different cultures:*** Four studies among the selected works studied the impact of dental alignment on the aesthetics of the smile. In the study by Al Zarea and al., carried out in Saudi Arabia, 41.8% of participants found that their teeth are not aligned. While in Brazil's the same was revealed by 74.6% of individuals in the study of Boeira and al. and 45% of participants wanted to do orthodontic treatment to improve their dental appearance. The study by Muller *et al.* showed that 25.83% of individuals are embarrassed by their smile because of non-alignment. The alignment of teeth is ranked third cause of dissatisfaction of the dental appearance after the color and shape of the teeth in an Ivorian population. A single study by Cotrim *et al.* in Brazil, comparing perception between the professional and non-professional groups, found a lack of significant difference in perception between groups and reported that tooth alignment is the most criticized factor by the public jury.

***Influence of gingival exposure on the perception of the smile according to different cultures:*** Seven studies among the selected studies considered the impact of gingival exposure on the perception of the smile. The study by Zagar *et al.* conducted in Croatia (Caucasians), showed that the majority of participants were completely satisfied with their dental appearance. The study by Hata *et al.* in Japan, involved dental students and showed that the smaller the exposure, the more attractive the smile. The study by McLeod *et al.* in the US and Canada, showed that Canadians are more susceptible to gummy smile with a narrow acceptability interval. Ideal value: + 2.7mm for Canadians vs. + 2.1mm coverage for the United States (significant difference). Another study by Sharma *et al.* in the US, involving Caucasians of American nationality, Indians of American nationality, and Indians living in India, found no significant difference in the perception of dental aesthetics between men and women between the three groups. The study by Al Taki *et al.* conducted in Dubai, showed that no one in the group of orthodontists and general dentists chosen the image with 3 and 4 mm gingival exposure, however the public jury appreciated the photo with 4 mm exposure. Mokhtar *et al.* in Saudi Arabia reported that the presence of the gingival smile negatively and significantly influences the

perception of the smile. It is considered unpleasant for 70% of dentists and 41% of the public jury. Ousehal *et al.* in Morocco, showed that gingival exposure is more criticized by dentists in comparison with the public jury especially when it exceeds 4 mm. McLeod *et al.* in the US and Canada have shown that the cultural / national setting influences perception significantly.

***Influence of the size of the teeth on the perception of the smile according to the different cultures:*** Over-all, 5 studies evaluated the influence of tooth size on the perception of the aesthetics of the smile. The study by Rosentiel *et al.* conducted in the USA and Canada, showed that the evaluators prefer the proportions of their natural teeth in relation to the proportion of gold. Two studies comparing perceptions between professionals and nonprofessionals found the following results: The Cotrim *et al.* Study conducted in Brazil found no significant difference in the assessment between groups. For general dentists: small teeth are unpleasant. Between the three groups, disproportionate teeth are the most criticized by the public jury and general dentists. However, the Al Taki and al. study conducted in Dubai showed that orthodontists and general dentists as well as the public jury preferred the control image. A difference in length of 1 mm more, up to 2 mm, was acceptable respectively for professionals and the public jury. While for the width, the study found that the 3 groups prefer control image, but with a great tolerance of increase for the public. The multicentric study by Sadrhaghghi *et al.* conducted in Iran (Isfahan, Tabriz, Tehran, Yazd), Qatar (Doha), Italy (Rome), Australia (Sydney), and the USA (Chicago) found that "race" and ethnicity influence the aesthetic judgment of changes in the golden proportion. Cotrim *et al.* in Brazil, reported that there is a cultural preference for proportionately large teeth.

## DISCUSSION

The main objective of our study was to evaluate the influence of cultural parameters in the perception of aesthetics in dentistry. Our secondary objective was the study of particularity or universality in the perception of aesthetics in dentistry. The bibliographic search for our systematic review includes the articles published between 01/01/2000 to 03/04/2018 which allowed the collection of a sufficient number of articles for the analysis. We faced the difficulty of synthesizing all the conclusions of the researches, particularly because of the difference of the recommended protocols: photos without numerical alteration accompanied by a questionnaire, photos with numerical alteration accompanied by a questionnaire, photos without questionnaire, questionnaire without photos. Given the mixing and mobility of populations (migration ...), more or less important for some countries, the results can be altered by bias, thus preventing a good evaluation of the cultural factor.

***Evaluation of the influence of diastema according to different cultures:*** The influence of the diastema on the attractiveness of the smile was evaluated in 8 cross-sectional studies. Six works digitally modified their smiles; a study used a protocol without alteration<sup>1</sup> and only one work was based on a questionnaire without use of photos. For the Arabs, Afro-American and Brazilian population, the presence of a diastema in a smile is considered unattractive. Only the Nigerian population has shown that the presence of a diastema is attractive. This diastema preference is correlated with a high incidence of diastema in this population (28.9%). We note that

there is a contradiction between the results of the two studies conducted on populations of African Americans in North America. Is this difference due to a change in "mores" or a difference in sample size? We support the article of Rosentiel *et al.* who worked on a sample of 1934 individuals including 372 blacks. There is no standard judgment on the pleasant or unpleasant nature of the diastema.

**Evaluation of the influence of colour according to different cultures:** Eight cross-sectional studies addressed this parameter. 3 works used a questionnaire with photos 8, 28, 30 and 5 works were based on a questionnaire without use of photos. The majority of these studies demonstrated that colour is the most important aesthetic criterion, having a significant influence on self perception. Observer's age, gender and subjectivity, as well as other factors, influence the evaluation of colour and make it extremely complex. There is no standard judgment regarding dental colour. The choice of the colour of the teeth remains one of the aspects which increase the success rate of a dental treatment. Moreover, it is essential to carry out work in this field which must include a more precise way of defining the two parameters: dental esthetics and ethnicity. Similarly, the effect of ethnicity on appearance could be examined by studying its relationship to skin colour. This technique has already been done by different authors. The use of a more objective measure to determine the hue of the tooth, such as colorimeter or spectrophotometer that can remove the subjectivity in identifying the dental shade of the participants.

**Evaluation of the influence of alignment according to the different cultures:** Four studies among the selected works studied the impact of dental alignment on the aesthetics of the smile. Studies by Al Zarea *et al.* by Boeira *et al.* and Muller *et al.* in Saudi Arabia, Brazil and Côte d'Ivoire concluded that the absence of dental alignment negatively influences the attractiveness of the smile. The study by Cotrim *et al.* conducted in Brazil showed that there is no significant difference in the assessment between the group of orthodontists, general dentists and the public jury. Except that the non-aligned teeth are more criticized by the public jury. The aesthetics of "alignment" has become a major concern for patients and orthodontists. This is the main reason why patients seek orthodontic treatment. The cultural factor does not influence the perception of the smile regarding the "alignment" factor, which remains a constant among all the populations studied. Further studies are needed to better study the influence of this parameter.

**Evaluation of the influence of the gingival exposition according to different cultures:** Seven studies among the selected works studied the impact of gingival exposure on the perception of the smile. Five works used photos with numerical alteration, while 2 works were based on photos without alteration. Five studies concluded that the presence of a gingival exposure negatively influenced the smile (Dubai, Japan, Canada and the United States, Saudi Arabia and Morocco). The "gingival exposure" remains unappreciated in the majority of studies, although both studies (Sharma, Zagar) show the opposite because they do not evaluate large gingival exposures. As with the other criteria studied, several parameters can influence the perception of this criterion. The Zagar *et al.* Study in Croatia reported that women were more interested in dental treatments to improve their dental appearances. However, given the contradictory results about the influence of the gender of the evaluator on the perception

further studies adopting the same protocol are necessary to evaluate the evidence of this factor. The profession may influence the perception of the smile according to the studies that compare the professional and non-professional group. The study by Ousehal *et al.* in Morocco reported that gingival exposure is more criticized by dentists in comparison with the public jury especially when it exceeds 4 mm. Likewise for the study by Al Taki *et al.* conducted in Dubai and Mokhtar *et al.* in Saudi Arabia. This explains the great influence of professional culture in relation to ethnic culture. Therefore the hypothesis to check, is about the standardization of the perception of the aesthetics of the smile on the professional level, given the globalization of knowledge and the "erasure" in the long term of ethnic or cultural perception.

**Evaluation of the influence of tooth size by different cultures:** A total of 5 studies evaluated the influence of tooth size on the perception of the aesthetics of the smile. Two works (Rosentiel, Sadrhaghghi study) used photos with a numerical alteration, whereas only one work was based on photos without numerical alteration, one work used photos with alteration accompanied by a questionnaire, and the last work was based on unaltered photos accompanied by a questionnaire. The multicentric study by Sadrhaghghi *et al.* conducted in Iran (Isfahan, Tabriz, Tehran, Yazd), Qatar (Doha), Italy (Rome), Australia (Sydney), and the USA (Chicago) found that "race" and ethnicity influence the aesthetic judgment of changes in the golden proportion. Cotrim *et al.* in Brazil reported that there is a cultural preference for proportionately large teeth. Two studies comparing perception between professionals and non-professionals found the following results. For the Cotrim *et al.* Study conducted in Brazil, no significant difference was found in the evaluation between the groups. However, the Al Taki *et al.* study conducted in Dubai showed that orthodontists and general dentists as well as the public jury preferred the control image. A difference in length of 1 mm more, up to 2 mm, was acceptable respectively for professionals and the public jury. While for the width, a great tolerance of increase for the public. The factor "gender" was evoked in 2 studies. The Zagar *et al.* study conducted in Croatia (Caucasians), and Rosentiel *et al.* in the USA found a significant difference in the assessment of tooth size by gender. The preference of the large size of the teeth transcends ethnic factors, gender and professional culture.

## Conclusion

Based on the findings and taking into account the limitations of our review and the heterogeneity of parameters and protocols described, it can be concluded that the large inter-incisal diastema, appreciated in several African countries, is mentioned as a negative criterion in the aesthetics of the smile among occidentals. There is no standard judgment on the pleasant or unpleasant nature of the diastema. Similarly for the teeth shade there is no uniform judgment mentioned. Moreover, the cultural factor does not influence the perception of the smile regarding the "alignment" factor, which remains a constant among all the populations studied. The factor "gingival exposure" remains unappreciated in the majority of studies. For the last criterion, we concluded that the preference of the large size of the teeth surpasses the ethnic factors, gender and professional culture. Besides, the society influences our aesthetic judgment, thus, depending on the culture the aesthetics of the smile can be different. Therefore the perception of the smile is influenced by several factors:

sex, socio-origin cultural ... It can vary from one individual to another and the judgment of the dentist doctor may not agree with that of patients or even between practitioners of different specialties. Finally, it seems necessary to "individualize" most often the treatments for each patient.

## REFERENCES

- Akinboboye, B, Umesi, D. and Ajayi, Y. 2015. Transcultural perception of maxillary midline diastema. *Int J Esthet Dent.* 2015 Winter; 10(4):610-7.
- Al Taki, A., Khalesi, M., Shagmani, M., Yahia, I., Al Kaddah, F. 2016. Perceptions of Altered Smile Esthetics: A Comparative Evaluation in Orthodontists, Dentists, and Laypersons. *Int J Dent.*, 7815274.
- Alshahrani, I., Togoo, A.R, Alshahrani, A., Alshahrani, A.S., Alshehri, A.D., Sadatullah, S. 2017. Esthetic perception of maxillary midline diastema among female students at King Khalid University. *Gulf Med J.*, 6(10):49-54.
- Al-Zarea, B.K. 2013. Satisfaction with appearance and the desired treatment to improve aesthetics. *Int J Dent.*, 912368.
- Boeira, G.F., Salas, M.M.S., Araújo, D.C., Masotti, A.S., Correa, M.B., Demarco, F.F. 2016. Factors influencing dental appearance satisfaction in adolescents: a cross-sectional study conducted in Southern. Brazil. *Braz J Oral Sci.*, Jan-Mar;15(1).
- Brisman, A.S. 1980. Esthetics: a comparison of dentists' and patients' concepts. *J Am Dent Assoc.*, 100(3):345-52.
- Chiche, G.J., Pinault, A. 1994. Esthetics of anterior fixed prosthodontics. Quintessence Pub. Co.
- Egger M, Sterne J.AC, 2001. Smith G.D. Uses and abuses of meta-analysis. *Clinical Medicine.*, 1(6) 478-84
- Feingold A. 1992. Good-looking people are not what we think. *Psych Bulletin.*, 111: 304- 341
- Hata, K., Arai, K. 2016. Dimensional analyses of frontal posed smile attractiveness in Japanese female patients. *Angle Orthod.* 2016 86(1):127-34.
- Hue O. 2008. Le sourire en prothèse ou l'éloge du sourire. *Actual. odonto-stomatol.* 242 : 129-141
- Hue O. 2008. Le sourire en prothèse ou l'éloge du sourire. *Actual. odonto-stomatol.* 242 : 129-141
- Kissler J, Bauml K. 2000. Effects of the beholder's age on the perception of facial attractiveness. *Acta Psycho.*, 104: 145-166.
- Lajnert V, Pavičić DK, Gržić R, Kovač Z, Pahor D, Kuis D, Simonić-Kocijan S, Antonić R, Bakarčić D. 2012. Influences of age and maxillary anterior teeth status on patient's satisfaction with dental appearance and tooth colour. *Gerodontology.* Jun; 29(2):e674-9.
- McLeod C, Fields HW, Hechter F, Wiltshire W, Rody W Jr, Christensen, J. 2011. Esthetics and smile characteristics evaluated by laypersons. *Ang Orthod.*, 81(2):198-205.
- Moher D, Liberati. 2009. A Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Ann Intern Med.*, 18;151(4):264-9.
- Mokhtar HA, Abuljadayel LW, Al-Ali RM, Yousef M. 2015. The perception of smile attractiveness among Saudi population. *Clin Cosmet Invest Dent.* Jan 20; 7:17-23.
- Muller P.D; Didia E.L; Bakou O.D; Konate N.Y; Djeredou, Benjamin K. Auto-perception du sourire et des dents : enquête réalisée auprès d'adultes de la région d'Abidjan, Côte d'Ivoire. *Act Odonto - Stomat; Les Ulis.* 2016 Apr N° 275
- Niaz MO, Naseem M, Elcock C. 2015. Ethnicity and perception of dental shade esthetics. *Int J Esthet Dent.*, Summer; 10(2):286-98.
- Ousehal, L., Aghoutan, H., Chemlali, S., Anssari, I.F., Talic, N. 2016. Perception of altered smile esthetics among Moroccan professionals and lay people. *Saudi Dent J.* 28(4):174-182.
- Paris, J.C., Faucher, A.J. 2004. Le guide esthétique. Comment réussir le sourire de vos patients. Paris : Quint. Inter,
- Podratz, K.E., Dipboye, R.L. 2002. In search of the "beauty is beastly" effect. Paper presented at the 17th Annual Conference of the Society for Industrial and Organizational Psychology, Toronto, Canada.
- Rehman, K., Khan, F.R., Rahman, M. 2011. Assessing the perception of smile attractiveness in young adults. A pilot study. *J Pak Dent Assoc.* (4) : 206-210
- Rodrigues, Cde D., Magnani, R., Machado, M.S., Oliveira, O.B. 2009. The perception of smile attractiveness. *Angle Orthod.* 79(4):634-9.
- Rosenstiel, S.F., Rashid, R.G. 2002. Public preferences for anterior tooth variations: a web-based study. *J Esth Rest Dent.*, 14(2):97-106.
- Rufenacht CR. 1990. Fundamental of Esthetics. Chicago Quint Pub.
- Sadrhaghghi, A.H., Zarghami, A., Sadrhaghghi, S., Mohammadi, A., Eskandarinezhad, M. 2017. Esthetic preferences of laypersons of different cultures and races with regard to smile attractiveness. *Ind J Dent Res.*, 28(2):156-161.
- Zagar M, Knezović Zlatarić D. 2011. Influence of esthetic dental and facial measurements on the Caucasian patients' satisfaction. *J Esth Rest Dent.*, 23(1):12-20.

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