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AN EVALUATION OF LIP-TOOTH RELATION DURING SMILE WITH DIFFERENT DENTAL RELATION

(EVALUASI RELASI BIBIR DAN GIGI KETIKA TERSENYUM PADA KLASIFIKIFASI DENTAL YANG BERBEDA)

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ABSTRACT

A smile is a form of the human face that can increase the value of the beauty of a look. Teeth lips and supporting soft tissue will provide a beautiful and harmonious smile. There is an analytical method that works to analyze the smile parameters for the teeth and mouth of the patient. This study aims to analyze the characteristic of a smile on the smiling frontal photo compilation with Angle's malocclusion. The smile analysis of this study took a sample of 16-18 years succeeded in 81 people with 37 men and 47 women. Data was taken using adobe photoshop to measure maximum incisor exposure, slit between the mouth, width of the inner commissure. The research results showed a different value both on the average and statistically significant differences in assessment among malocclusion groups for maximum incisor exposure parameters and gaps between spaces. Classification of Angle's class I, II, and III patients had different smile characteristics.

Keywords: lips; malocclusion; photography; smile

ABSTRAK

Senyum merupakan ekspresi yang dapat mengekspresikan wajah. Relasi gigi, bibir, dan jaringan lunak merupakan faktor penting yang memengaruhi pencapaian estetik saat tersenyum. Hubungan molar satu atas dan bawah yang digunakan dalam menentukan maloklusi dental dapat mempengaruhi senyum. Terdapat parameter untuk menganalisis senyum yang dapat menilai berbagai aspek ketika tersenyum, serta dikaitkan dengan berbagai relasi dental maupun skeletal. Penelitian ini bertujuan untuk menganalisis karakteristik senyum remaja pada foto frontal wajah ketika tersenyum dan pengaruhnya pada klasifikasi tertentu. Penelitian potong lintang ini dilakukan pada remaja usia 16-18 tahun ras deutromelayu di Kota Cimahi. Analisis senyum dilakukan pada foto pasien dan diukur masing-masing maximum incisor exposure, interlabial gap, inner commissure width. Hasil penelitian menunjukkan terdapat perbedaan signifikan di antara kelompok maloklusi untuk parameter maximum incisor exposure dan interlabial gap. Dapat disimpulkan bahwa terdapat perbedaan senyum pada pasien dengan maloklusi klas I, II, dan III tentu memiliki karakteristik senyum yang berbeda.

***Kata kunci**: bibir; maloklusi; fotografi; senyum*

INTRODUCTION

One of the essential human facial expressions is a smile that may be influenced by the reward values of a human beings. The attractive value of the face with (an) enhanced smile will differ from one to another. Facial esthetics also frame in from the eyes and expression of the overall appearance. The physical features of the esthetic human's face are included lips, cheekbones, smiles-teeth, and the nose.

The smile's attractiveness may help people achieve the main goal of social status, and it's very related to the teeth and lips relation. The optimal horizontal and vertical relationship of the anterior teeth is

also the key to improving the characteristic of the smile. Teeth alignment is in line visible when a smile is one of the important aspects that contribute to the smile's attractiveness.

Patients concerned about the esthetic of smile are the most reason for seeking orthodontic treatment. One of the orthodontic treatment protocols is correcting the teeth-lips relation and the smile. Orthodontists may focus on the occlusal relationship and alignment of the teeth, but on the other hand, patients are also concerned about their facial attractiveness.

Malocclusion is a factor that contributes to the attractiveness of the facial smile, and one of the most factors that affect the smile is the dental and jaw relationship. Anteroposterior molar relation, according to Angle's classification of malocclusion maybe affect(s) the smile attractiveness.

Several methods introduced to evaluate a smile and its relation to the dental relationship have been reported in previous research. The ratio of the lip-teeth relationship during a smile, smile symmetry ratio, and buccal corridor are the common factors used to evaluate the smile. Upper lip height and upper lip curvature are also the most affected by an attractive smile.

The purposes of this research are to evaluate the antero-posterior relation of first molar relation problems with the smile of (the) young population in Kota CimahiWest Java Indonesia. This research has been detailed with ethically approved no. 005/UM1.11/2019 by the ethical commission, Faculty of Medicine Universitas Jenderal Achmad Yani.

METHOD

This study was performed with cross-sectional design methods with a sample of 40 facial photographs of 16–18 year(s) and confirmed as deutromelayu race from high school student population in Kota Cimahi, West Java. The proportional stratified random sample was taken for the population to be included in this study. There were no missing teeth and another congenital defect, no previous orthodontic treatment, and no face and neck surgery. According to Angle, each participant was classified with class I, II, and class III molar relationship has been confirmed with (the) examiner through clinical assessment.

Facial frontal photographs of the samples with (the) inclusion of criteria were taken with digital mirrorless camera DSLR (Fujifil^{m} X-T10, CMOS Sensor) and 80 magnificent with 1. 5 x 1 m^2 white screen background. The camera and built-in tripod were performed with natural and upright position with 100 cm distances between the object and focused to the nose of the sample. The position of the sample was

parallel to Frankfurt Horizontal Plane (FHP) and the subject was 75 cm behind the screen.

All the samples were instructed to say "cheese" for 3 seconds to perform a social smile, and the photo was taken three times for a social smile photograph. The photos were transferred to the computer and measured with an adobe photoshop application.

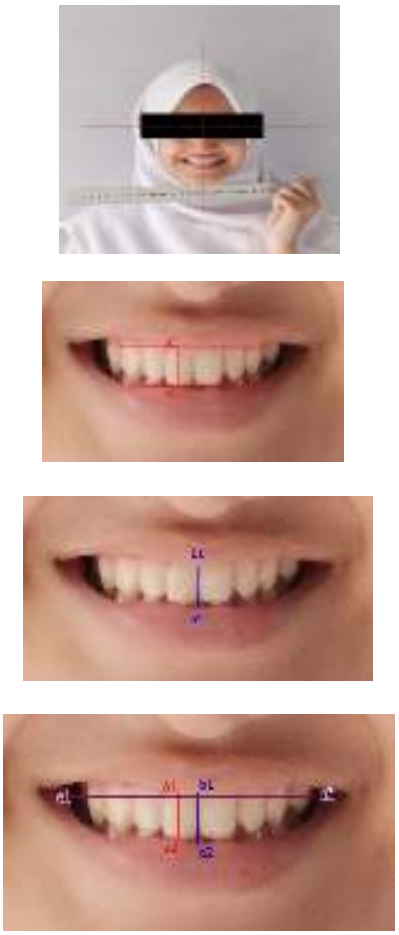

Figure 1. The measured used to evaluate the smile.

Table 1. The measured use to evaluate the smile

Variable	Brief Definition
Height of central incisor (mm) (a1-a2)	Distance of gingival margin to incisal edge of central incisor
Width of central incisor (mm) (b1-b2)	Distance of mesio-distal central incisor
Maxillary incisor display (mm) (a1-a2)	Distance between most superior point to inferior point of anterior maxilla while smile.
Maxillary incisor display (ratio %)	The Ratio of height maxillary central incisor while smiling.
Interlabial Gap (mm) (c1-c2)	The labial gap distance between superior stomion to inferior lips while smile.
Philtrum height (mm) (d1-d2)	Distance between subnasale to the inferior point of lips while smile
Left and right commissure height (mm) (d1-e1)	The distancebetween left and right to outer commissure through subnasale point
Smile width or outer commissure width (mm) (f1-f2)	Distance between left vermillion to right vermillion.
Smile index (ratio)	The ratio between smile width and height of the smile.
Visible dentition width (mm) (g1-g2)	Distance between lateral right to left upper incisor.
Maxillary gingival display (mm) (h1-h2)	The gingival exposure to the anterior lip-teeth while smile.

The photos maximum incisor exposure, interlabial gap, and inner commissure width were measured. The imaginer points of A1 on the cervical end of the central upper incisor and point A2 on the incisal high was marked. The points thus connected to the other with the measure tool of adobe for millimeter measurement. The reproducibility of the evaluation process was evaluated three times by the same investigator. The upper incisor exposure was less in females when compared with males in all three groups, and this difference was significant in the vertical facial growth group. Smile parameters in males and females were statistically significantly different, with higher mean values for upper incisor exposure, incisal edge to lower lip

distance, interlabial gap, intercanine width, total width, smile width, and lower lip vertical length in males than in females.[10,11]

RESULT

The lips and smile relation were framed in the display zone of the smile. Within this framework, the components arc of the smile consist of teeth, and the gingival scaffold been captured with one framework. Soft-tissue determinants of the display zone are lips thickness, inter commissure width, inter-labial gap, smile index, and gingival architecture clearly defined for the analysis. The smile arc, formed by the curve of incisal edges of the anterior maxillary teeth, had parallelism between the smile arc and the curvature of the lower lip. The harmony of facial esthetic is mandatory related to the smile framework and incisal display. The social or relaxed smile, typically used as a greeting, is voluntary, unstrained, static, and represents(s) facial expression. The relation between sex and Angle's classification in this research is shown in the table below.

Table 2. Gender and Angle classification according to Angle's

Sex	Angle's Molar Relation			Total
	Class I	Class II	Class III	
	(%)			
Male	10(27%)	**14(37.8%)**	13(35.1%)	37(100.0%)
Female	**17(38.6%)**	13(29.5%)	14(31.8%)	44(100.0%)
Total	27(33.3%)	27(33.3%)	27(33.3%)	81(100%)

The table shows a strong relationship between gender and Angle's relation. Class II Angle malocclusion was divined as (the) anterior position of the maxilla. It was more likely a most characteristic malocclusion of the deutromelayu and female populations. A part of lips separation for (the) female population were between upper and lower lips related to muscular contraction of the buccinators and mentalis muscles. The teeth and sometimes the gingival scaffold is displayed differently for gender and age.

The enjoyment smile, elicited by laughter or great pleasure, is involuntary. It results from (the) maximal contraction of the upper and lower lip elevator and depressor muscles, respectively. It causes full lips expansion, with maximum anterior tooth display and gingival show. The teeth and lips analysis were shown in the smile, capturing the interrelation between the components. Anteroposterior position of the mandibular for class III patients contributed to the position of the lips while smiling. The flat curve and indeed reverse curved smile can happen for this type of patient.

DISCUSSION

We all agree that a smile is an essential aspect of overall aesthetics and plays human attractiveness. Smile aspects have come a long way to include

orthodontic diagnosis and treatment planning and, of course, a significant goal of the smile esthetics. Factor influenced of a smile, related to growth-development, maturation, and aging of the perioral soft-tissues have a profound effect on the appearance of smiling presentations. Lips-teeth relation and maxillofacial part are mandatorily advised for the smile framework. Some aspect directed to the smile is the counterpart for facial attractiveness and mimic. The rule of anteroposterior skeletal and dental position had interrelated to the smile arc formation.[8,14]

According to the smiling photograph used in our study, smile evaluation is shown as an expression of the social situation. Many dental problems like malocclusion cause a profound impact on adolescents' aesthetics and psychosocial behavior.[17]

The anteroposterior position of the jaw performed a strong correlation between smile arc and the inter-labial gap. Increasing vertical dimension could be increased the height of inter labial gap, upper incisal edge to lower lip distance, and smile display zone area. A different pattern of malocclusion exhibit characteristic of smile characteristic features. The appearance of the upper incisal display while smiling is more closely associated with lip elevation while smiling than vertical dental position factors.[13,15]

The orthodontic patients can be categorized as preadolescents, adolescents, and adults, and it would also influence the esthetic need. The rule of growth-development, processed maturation, and aging regulation of the perioral soft tissues have a profound effect on the appearance of smiling display. Orofacial muscle, lips, and mastication apparatus potentially increased with the smile expression. Smile characteristic views on photographs can be affected by different dental and skeletal malocclusion types.[15]

Clinical and orthodontists are more likely to use the facial photograph for analysis since it is simple and economical for patients, easy to achieve, and the number of samples can be easily increased. Research has been reported about the smile characteristics related to malocclusion. Cheng et al.; declared that different types of malocclusion had different smiles and were also influenced by the skeletal pattern. The straight horizontal position of the teeth also plays the role of an acceptable smile. Nevertheless, the horizontal overbite relation has no similarity with the smile design and appropriate esthetic patient.[16,17]

CONCLUSION

Smile analysis and design generally

involve a compromise between two-part that are often contradictory, between the esthetic desires of the patient and orthodontist. The clinicians can evaluate the patient's dynamic anterior tooth display and incorporate smile analysis into routine treatment planning. Esthetic smile design is a multifactorial decision-making process that allows the clinician to treat patients with an individualized, interdisciplinary approach.

CONFLICT OF INTEREST

The author declared no conflicts of interest potential commercial background in this research.

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