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**THE RELATIONSHIP BETWEEN FACIAL SHAPE AND TOOTH SHAPE AGES 12-14 YEARS OLD IN SOUTH DAHA**

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**ABSTRACT**

**Introduction:** The facial and maxillary central incisor shape is classified into triangular, oval, and square. There is a correlation between the facial shape and maxillary permanent central incisors. This theory is still used to determine tooth selection and determine aesthetics when restoring incisors. This study aims to determine the relationship between facial shape and tooth shape aged 12-14 years in Daha Selatan. **Methods:** The research was conducted using observational analytics with a cross-sectional approach and using a non-parametric test Spearman Rho correlation. **Results:** 76 people (89.4%) had an ovoid facial shape with an ovoid tooth, 3 people had an ovoid facial shape with a square tooth shape, and 3 people had an ovoid facial shape with tapering teeth form as many as 6 people (7.1%). While the sample that has a square facial shape with a square tooth shape is 14 people (87.5%), 2 people have a square facial shape with an ovoid tooth shape (12.5%), and a square facial shape with a tapering tooth shape is 0 (0 %). As for the sample that has a tapering facial shape with a tapering tooth shape for as many as 4 people (80%), a tapering facial shape with an ovoid tooth shape for as much as 1 person (20%) and there are no samples with a tapering facial shape with a square tooth shape. **Conclusion:** There is a relationship between the facial shape and The tooth shape aged 12-14 years in Daha Selatan (90.57%).

**Keywords :** Facial Shape, South Daha, Tooth Shape

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**INTRODUCTION**

Smile is a main component in presentations of a human being favouring social acceptance. The position, shape and colour of the permanent upper central incisors are important factors in determining a person's aesthetic when smiling.<sup>1</sup> Aesthetics is a major consideration for patients seeking Prosthodontic treatment. The size and shape of the maxillary anterior teeth help not only the aesthetics of the teeth, but also the aesthetics of the face with the aim of restoring the maxillary anterior teeth to match the facial appearance.<sup>2,4</sup>

Based on Williams' theory, there is a correlation between the facial shape and the shape of the maxillary permanent central incisors called the Law of Harmony. The law of harmony analyzed measurements of the face and central incisors by measuring the width of the zygomatic arch, the interpupillary distance, the distance between the inner

corners of the eye, the interalar width, and the distance between the labial commissures.<sup>1</sup>

The facial shape and the shape of the maxillary central incisors were classified into three categories, namely triangular, oval, and square. This theory is still used to determine tooth selection and aesthetics when restoring incisors.<sup>5,6</sup> This was proven by the Vinothini study in 2013 that there is a relationship between facial shape and tooth shape in the population in India.<sup>7</sup> Then it is supported by Korlakunte research in 2013 which states that there is a relationship between facial shape and tooth shape in the form of a square shape in men and an ovoid shape in women. The predominant facial shape and the acquired tooth shape are useful in the selection of anterior teeth for edentulous patients among the Indian population.<sup>5</sup>

Indonesia has various types of tribes with ethnic groups that tend to have different skeletal and jaw patterns, therefore the size and shape of the jaws

and faces in one ethnic group are different from other ethnic groups.<sup>8</sup> Sipayung (2019) states that the Sumatran population has a relationship between facial shape and the shape of the jaw arch in edentulous patients which can help in the selection of complete denture elements. The Banjar tribe has similarities with the inhabitants of the Sumatran population because they both follow paternalistic and maternalistic lines. However, until now in Indonesia there is still no specific research on the relationship between tooth shape and facial shape especially in the Banjar tribe. Based on the background that has been presented and there is no research on the relationship between tooth shape and facial shape in the Banjar tribe, the researchers are interested in conducting research on the relationship between facial shape and tooth shape at the age of 12-14 years in Daha Selatan.

## METHODS

The study was begun by obtaining permission and ethical clearance from the Ethical Committee of Faculty of Dentistry No. 047/KEPKG-FKGULM/EC/IV/2022. This study used analytic observational with a cross-sectional approach, namely the observation approach or data collection at the same time to see the relationship between the independent variable and the dependent variable by taking instantaneous measurements. The results of this data will provide data on whether or not there is a relationship between facial shape and tooth shape at the age of 12-14 years in Daha Selatan.

The sample size in this study was 106 children from the Daha Selatan, Hulu Sungai Selatan, South Kalimantan, which is located in 14 villages that meet the inclusion and exclusion criteria. The sample selection technique used the purposive sampling technique, namely the sample selection technique selected in accordance with the provisions and criteria of the researcher.

The procedure in this study was carried out in March 2022 after obtaining ethical approval from FKG ULM and a research permit from Daha Selatan. The sample was selected based on the inclusion criteria by the researcher. Researchers provide information to adolescents and parents in the form of notification letters and approval letters in the form of informed consent. Researchers take samples using level 3 APD by taking photos using a digital camera (Sony DSC-F707 with Carl Zeiss Vario-Sonnar 9.7mm zoom lens) placed at a distance of 1.10 m from the face and 20 cm from the maxillary central

incisors in the frontal plane with the subject sitting in front of the background. The images taken were taking photos of the frontal face and of anterior teeth occlusion. The image is processed with the Photoshop CS 3 program initially by converting it to black and white, then is measured using the Image Tool 3.0 program. The results obtained will then be processed using the Microsoft Excel application on the computer.

The facial shape is determined by an imaginary line connecting three points on each side of the face. The first point is at the widest part of the forehead in the upper third of the face. The second point is at the widest part of the middle third of the face, i.e. at the most prominent part of the zygoma. The third point is at the widest part of the lower third of the face, at the angle of the mandible. The shape of the tooth was determined on the right maxillary central incisor by making an outline around the buccal surface of the tooth, which corresponded to the mesial and distal contours, the incisal edge and the cervical margin of the tooth.

Analysis of the data used in this study was a Spearman correlation analysis which aims to determine the relationship between facial shape and tooth shape at the age of 12-14 years in Daha Selatan ( $p < 0.05$ ).

## RESULTS

The results of facial shape of 106 samples in this study were dominated by ovoid facial shapes for as many as 86 people (81.13%) consisting of 49 women and 37 men. The square facial shape is 15 people (14.15%) consisting of 10 men and 5 women. The tapering facial shape is 5 people (4.72%) consisting of 5 men. The results of the tooth shape of 106 samples in this study were dominated by an ovoid teeth shape in as many as 78 people (73.58%) consisting of 46 women and 32 men. The number of square teeth was 18 people (16.98%) consisting of 12 males and 6 females. The shape of the tapering teeth was 10 people (9.43%) consisting of 8 men and 2 women. The results of the relationship between facial shape and tooth shape on 106 samples in this study showed that 96 samples (90.57%) had a relationship between facial shape and tooth shape, which were dominated by 51 women and 45 men. Meanwhile, for as many as 10 samples (9.43%) did not have a relationship between facial shape and tooth shape, which were dominated by 7 men and 3 women (Table 1).

Table 1. Facial shape and tooth shape in male and female

	Facial Shape			Tooth Shape			Relationship between facial shape and tooth shape	
	Ovoid	Square	Tapering	Ovoid	Square	Tapering	Yes	No
<b>Male</b>	37 (71,15%)	10 (19,23)	5 (9,62%)	32 (61,54%)	12 (23,08%)	8 (15,38%)	45 (86,54%)	7 (13,46%)
<b>Female</b>	49 (90,74%)	5 (9,26%)	- (0,00%)	46 (85,19%)	6 (11,11%)	2 (3,70%)	51 (94,44%)	3 (5,56%)
<b>n(%)</b>	86 (81,13%)	15 (14,15%)	5 (4,72%)	78 (73,58%)	18 (16,98%)	10 (9,43%)	96 (90,57%)	10 (9,43%)

Table 2. Relationship between facial shape and tooth shape

		Tooth Shape			Sig	
		Ovoid	Square	Tapering		
<b>Facial Shape</b>	Ovoid	N	76	3	0,000	
		%	89,4%	3,5%		7,1%
	Square	N	2	14		0
		%	12,5%	87,5%		0,0%
	Tapering	N	1	0		4
		%	20%	0,0%		80%

Based on table 2 some samples that have an ovoid facial shape with an ovoid tooth shape as many as 76 people (89.4%), an ovoid facial shape with a square tooth shape for as many as 3 people (3.5%), and an ovoid facial shape with a tapering tooth shape for as many as 6 people (7.1%). While the sample that has a square facial shape with a square tooth shape is 14 people (87.5%), 2 people have a square facial shape with an ovoid tooth shape (12.5%), and a square facial shape with a tapering tooth shape is 0 (0 %). As for the sample that has a tapering facial shape with a tapering tooth shape as many as 4 people (80%), a tapering facial shape with an ovoid tooth shape as much as 1 person (20%) and there are no samples with a tapering facial shape with a square tooth shape.

Data analysis of the relationship between facial shape and tooth shape aged 12-14 years in the South Daha sub-district was carried out using a non-parametric test, namely the Spearman Rho correlation. The significance value was 0.000 ( $p < 0.05$ ), which means that  $H_0$  is rejected or there is a statistically significant relationship, namely the relationship between facial shape and tooth shape aged 12-14 years in Daha Selatan.

The Spearman correlation showed the significance value of the relationship between the facial shape and the tooth shape is 0.000, meaning that the correlation between the facial shape and the tooth shape has a significant or significant relationship. Coefficient of correlation between the

facial shape and tooth shape is 0.646 and the value of the correlation is positive, meaning that the shape of a person's face can be related to the shape of their teeth, and vice versa.

**DISCUSSION**

Aesthetics plays an important role in the success of complete denture treatment. The shape, shade as well as their arrangement of teeth should be based on individual requirements to achieve satisfactory aesthetics. Dentofacial morphology is closely related to facial aesthetics. Anterior teeth play a key role in the aesthetic analysis of the face. Mostly aesthetic is the primary consideration for patients seeking prosthetic treatment. The size and form of the anterior maxillary teeth are not only an aid to dental aesthetic but also to facial aesthetic. The goal is to restore the anterior maxillary teeth in harmony with the facial appearance. In the restoration of anterior teeth, many factors are to be considered, depending on the patient's expectations and the expertise of the dental practitioner. General dentists and Prosthodontists use some common principles regarding aesthetic features of teeth forms, such as gender characteristics and tooth, arch, and face form correlation.<sup>3</sup>

In this study, the facial shape is divided into three forms, namely square, ovoid, and tapering. The results of this study indicate that the distribution of facial shape at the age of 12-14 years is ovoid in males and females. The results of the Koralakunte

study in 2013 in India stated that the most facial shape in the male gender was square and in the female gender it was ovoid. The difference in facial shape in the results of this study with previous studies can be caused by racial factors, Indonesia is included in the Mongoloid race while India is included in the Caucasoid race. The Mongoloid race has a short and broad face, wide dental arches, and large incisors.<sup>9</sup> The most distinguishing feature in the mongoloid dentition is found on the lingual surface of the incisor in the fusion of the lateral or marginal ridges which formed a raised cingulum and creates a deep lingual fossa. The ridge fades toward the incisal portion of teeth, and this gives the tooth a shovel or scoop shape appearance.<sup>13,14</sup>

The results of the study on 106 samples aged 12-14 in Daha Selatan showed that the percentage of facial shape was dominated by ovoid facial shape with a percentage of 81.13% and ovoid tooth shape with a percentage of 73.58%. This was also found in Koralakunte's (2013) study, it was found that the ovoid facial shape dominates with 66% and the combination of square-ovoid teeth forms 58%.<sup>4</sup> The facial shape and tooth shape related in this study had a percentage of 90.57%. This is in line with research by Zakkula (2018) and Harshakumar (2018) which states that there is a strong relationship between a person's facial shape and the shape of their teeth in both men and women according to William's theory. Williams believed that the contour line of the upper central incisors has to be of opposite direction from the contour line of the face. William's theory is based on an anthropometric study, performed on more than one thousand skulls at the University of the "Royal College of Georgia". Williams apostrophised that many face shapes exist, depending on the race, and all the shapes in all the races, even in apes, can be categorised into three basic types: ovoid, square and tapering, which are in accordance with reversed and increased tooth contour.<sup>2,6</sup>

The tooth shape is strongly influenced by heredity, gender and the function of each tooth. For example, the shape of the incisor teeth in men is square with a square distal angle, while in women the tooth shape is more oval with rounded distal angles. Ovoid tooth shape is a characteristic of individuals with an ovoid-shaped face, while teeth with a square shape are characteristic of individuals with a square-shaped face.<sup>8,9</sup> Leon William quoted by Fenn, stated that the shape of the upper central incisors has a close relationship with the facial shape. However, according to Fenn, this statement is still unscientific since there are also individuals who have an ovoid-shaped face, but have square-shaped teeth.<sup>10,11</sup>

In addition, some individuals have the types of incisor teeth in one jaw. In this study, if something

like that is found, then the author takes a form that is larger in size. This is most likely due to heredity. Marriage between individuals with ovoid-shaped teeth and individuals with square-shaped teeth can produce offspring that have both tooth shapes of their parents. Teeth that fit the face will look more aesthetically pleasing than teeth that don't fit the facial shape. This observation should be mastered by dentists when dealing with patients who use dentures because each patient has a different facial shape and tooth shape.<sup>10,11</sup> The aesthetic result of the incisor form does not depend on an agreement between face and tooth shapes, as changes in the smile are more relevant than the shape of the incisor itself. For example, the lack of an interdental papilla on an ovoid tooth gives it a triangular aspect. One way to overcome this would be to disguise the lack of a papilla with a subtle increase in cervical volume.<sup>1</sup>

In this study, there are several weaknesses, including the tools used to determine the shape of the jaw arch in this study use digital calipers which have a large possibility of human error, so it is recommended to use other tools such as using a computerized system to determine the shape of the jaw arch more accurately. Another weakness in this study is that the race factor is not considered. Kroeber in 1948 classified the world's races into four, namely Mongoloid, Caucasoid, Negroid, and Austroloid, each race has a specific jaw and facial arch shape.<sup>11</sup> The sample in this study was Indonesians belonging to the Mongoloid race. Therefore, it is necessary to do further research by taking into account the race factor.<sup>15</sup> Facial shape in this study was dominated by ovoid facial shapes in as many as 86 people (81.13%) and tooth shape was dominated by the ovoid tooth shape in as many as 78 people (73.58%). There is a relationship between facial shape and tooth shape aged 12-14 years in Daha Selatan with a percentage of 90.57%, which is dominated by the female sex as many as 51 people and 45 people.

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