

# Assessment of Effect of Age and Gender on Anterior Teeth During Rest, Speech and Smiling

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## Abstract

**Background:** Assessment of effect of age and gender on anterior teeth during rest, speech and smiling. **Subjects and Methods :** One hundred fifty adult fully dentulous patients in age ranged 18-48 years of either gender were divided into three groups of 50 each. Group I were in age ranged 18- 28 years, group II were from 28- 38 years and group III were in 38-48 years. Patients were instructed to pronounce "ah" 3 times, closing the mouth and resting between each sound. Then, "six" was pronounced 3 times. At rest and smile was display of maxillary and mandibular teeth were also recorded. **Results:** There were 30 males and 20 females in group I, 26 males and 24 females in group II and 22 males and 28 females in group III. While pronouncing six, teeth visible were 3.90 mm in group I, 3.50 mm in group II and 2.35 mm in group III. At ah, it was 3.62 mm in group I, 3.20 mm in group II and 1.86 mm in group III. At smile, it was 6.80 mm in group I, 7.12 mm in group II and 5.78 mm in group III. At rest, it was 2.86 mm in group I, 1.56 mm in group II and 0.82 mm in group III. There was significant difference in maxillary anterior tooth display at 'ah', mandibular anterior tooth display at 'ah', maxillary anterior tooth display at smiling and maxillary anterior tooth display at rest between both gender ( $P < 0.05$ ). **Conclusion:** Females displayed more maxillary anterior teeth as compared to males at smiling and rest. With advancing age, the display of maxillary anterior teeth decreased during smiling, speech and rest.

**Keywords:** Rest, Speech, Smile.

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## Introduction

Maxillary and mandibular anterior teeth play an important role in terms of facial aesthetics and dental aesthetics.<sup>[1]</sup> The aim of prosthetic management is to achieve appropriate dentolabial relations in relation with overall facial appearance. Patients' speech as well as smile should also be maintained.<sup>[2]</sup> Facial expressions of the patient should not be hampered. The appearance of maxillary and mandibular anterior teeth during these events are also important.<sup>[3,4]</sup>

Guidelines formed in order to create optimum anterior tooth visibility do not suggest any evidence concerning the changes that take place in the amount of exposure of anterior teeth with age.<sup>[5]</sup> It is considered less talkative issue regarding male and female appearance of teeth while speech, smile and during facial expressions.<sup>[6]</sup> However, in different age groups the appearance of teeth vary. Some authors have also documented variations in appearance of Maxillary and mandibular anterior teeth.<sup>[7,8]</sup> In literature, two methods have been proposed and

routinely followed. In 1<sup>st</sup> method, patient is asked to speak and smile and with measuring instrument, the display is measured.<sup>[9,10]</sup> However, the biggest drawback of this method is that the measuring instrument interferes with the natural behaviour of the patient. It is not regarded as accurate method. In 2<sup>nd</sup> method, photographs are used for recording smile and appearance of teeth. This method has few limitations also such as for standardization of the head position, ear rods are used which is not considered recommended method.<sup>[11-13]</sup> Considering this, the present study was selected with the aim to assess effect of age and gender on anterior teeth during rest, speech and smiling.

## Subjects and Methods

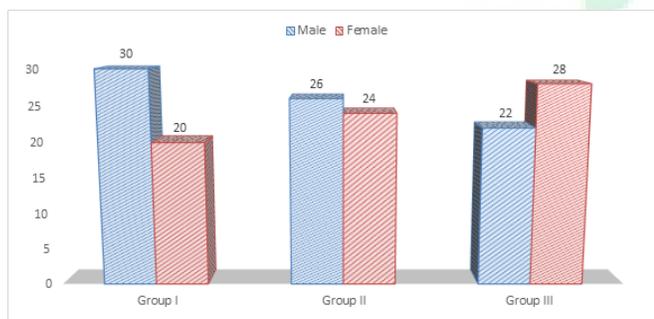
A total of one hundred fifty adult fully dentulous patients in age ranged 18-48 years of either gender were recruited in the study. The written consent for the participation of the study was obtained. Ethical clearance from review and ethical

committee of the institute was obtained beforehand. Patients with anterior tooth crowding, attrition, short lips, vertical maxillary deficiency and mandibular protrusion with open bite were excluded.

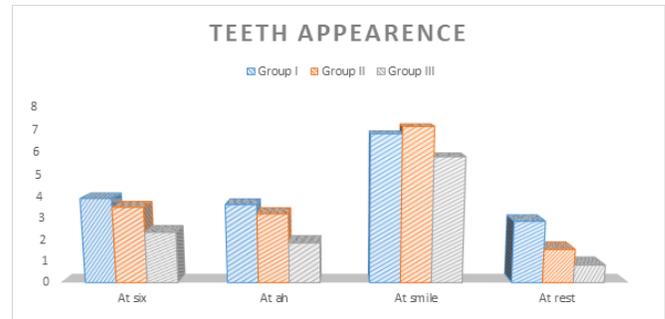
After recording demographic data of each patient, they were randomly divided into three groups of 50 each. Group I were in age ranged 18- 28 years, group II were from 28- 38 years and group III were in 38-48 years. Each group had 50 patients. They were asked to be in straight position, with the mandibular arch parallel to the floor. Each person was recorded with a digital camera mounted on a tripod stand from the subject. At a distance of 6 inches, patients pictures were obtained. At rest position, they were instructed to close mouth with teeth not in contact and the lips gently parted to see anterior teeth. They were instructed to pronounce "ah" 3 times, closing the mouth and resting between each sound. Then, "six" was pronounced 3 times. Finally, a smile was initiated. The movie files were played in a slow motion and individual frames of interest were selected. For the 'ah' sound, frames showing the lips and teeth at peak opening were selected. For 'six', frames were captured at the moment when the vowel was pronounced after the s sound. For smiling, those frames were captured in which the subject showed spontaneous smiling. Results of the study was compiled for assessment using Mann Whitney U test. The level of significance was set below 0.05.

## Results

There were 30 males and 20 females in group I, 26 males and 24 females in group II and 22 males and 28 females in group III [Table 1, Figure 1].



While pronouncing six, teeth visible were 3.90 mm in group I, 3.50 mm in group II and 2.35 mm in group III. At ah, it was 3.62 mm in group I, 3.20 mm in group II and 1.86 mm in group III. At smile, it was 6.80 mm in group I, 7.12 mm in group II and 5.78 mm in group III. At rest, it was 2.86 mm in group I, 1.56 mm in group II and 0.82 mm in group III. A significant difference was observed ( $P < 0.05$ ).



It was observed that there was significant difference in maxillary anterior tooth display at 'ah', mandibular anterior tooth display at 'ah', maxillary anterior tooth display at smiling and maxillary anterior tooth display at rest between both gender ( $P < 0.05$ ) [Table 3].

## Discussion

The present study was selected with the aim to assess effect of age and gender on anterior teeth during rest, speech and smiling. The dynamic nature of spontaneous smiling and speech demands a dynamic registration method.<sup>[14,15]</sup> Hence, a less intrusive dynamic registration method based on video-graphic measurement of spontaneous smiling and speech was used. When single frame capture method with photography was compared with current method, standardized digital videography delivers a wider range of images for selecting the parameters of lip-tooth relationships during facial visualization. In our study, we recruited 150 adult patient sin age ranged 18-48 years, we divided these patients into three groups. Each group comprised of 50 patients. Group I had 30 males and 20 females, group II had 26 males and 24 females and group III had 22 males and 28 females.

Bhat et al,<sup>[16]</sup> calculated and compared maxillary and mandibular anterior teeth the display during rest, speech and smiling in 120 subjects. They also assessed gender and age effect on visibility of teeth during rest, speech and smile. All expressions were recorded using software presentation tools. It was seen that mandibular anterior teeth were more visible during speech as compared to maxillary anterior teeth which were displayed more during smiling and at rest. The display of maxillary anterior teeth decreased during smiling as the age increased, speech and rest while the display of mandibular anterior teeth increased during smiling only. Females displayed more maxillary anterior teeth as compared to mandibular anterior teeth of males.

The results of our study showed that during pronouncing six, teeth visible were 3.90 mm in group I, 3.50 mm in group II and 2.35 mm in group III. At ah, it was 3.62 mm in group I, 3.20 mm in group II and 1.86 mm in group III. At smile, it was 6.80

**Table 1: Distribution of patients**

Gender	Group I	Group II	Group III
Male	30	26	22
Female	20	24	28

**Table 2: Appearance of maxillary and mandibular anterior tooth at speech, smiling and rest.**

Groups	At six	At ah	At smile	At rest	P value
Group I	3.90	3.62	6.80	2.86	<0.05
Group II	3.50	3.20	7.12	1.56	<0.05
Group III	2.35	1.86	5.78	0.82	<0.05

**Table 3: Display of maxillary and mandibular anterior teeth at speech, smiling and rest between both genders**

Teeth	t	Sig. (2-tailed)
Maxillary anterior tooth display at 'six'	-1.34	0.16
Mandibular anterior tooth display at 'six'	0.35	0.62
Maxillary anterior tooth display at 'ah'	-2.30	0.021
Mandibular anterior tooth display at 'ah'	2.40	0.052
Maxillary anterior tooth display at smiling	-3.4	0.03
Mandibular anterior tooth display at smiling	1.25	0.24
Maxillary anterior tooth display at rest	-2.9	0.04
Mandibular anterior tooth display at rest	0.81	0.32

mm in group I, 7.12 mm in group II and 5.78 mm in group III. At rest, it was 2.86 mm in group I, 1.56 mm in group II and 0.82 mm in group III. Al Hababah et al,<sup>[17]</sup> showed that at rest, males display more mandibular anterior teeth than females.

Van der Geld et al,<sup>[18]</sup> evaluated lip line heights and age effects in 122 males during spontaneous smiling, speech, and tooth display in the natural rest position. Three group were formed. First group had subjects in age ranged 20-25 years, group II had 35-40 years, and group III had 50-55 years. Lip line heights were measured with a digital videographic method for smile analysis. Maxillary lip line heights during spontaneous smiling were generally higher in the premolar area than at the anterior teeth. The aesthetic zone in 2/3<sup>rd</sup> of subjects included all maxillary teeth up to the first molar. It was found that maxillary lip line heights decreased significantly in all situations in geriatric group. Lip line heights during spontaneous smiling were reduced by approximately 2 mm. There was change in the mandibular lip line heights significantly and teeth were displayed less during spontaneous smiling in geriatric group. Mandibular tooth display in the rest position increased significantly. Upper lip length increased significantly by almost 4 mm in older subjects, whereas upper lip elevation did not change significantly.

Galagali et al,<sup>[19]</sup> in their study on 90 participants in age group of 18-25 years (40 male and 50 female) assessed measurement

of visible teeth surface area of the upper and lower anterior teeth during speech, using video photographic method. Results showed that the visible surface area of maxillary anterior was approximately 78.16 %, and the mandibular anterior was about 70.61% in young adults during speech.

The shortcoming of our study is small sample size.

## Conclusion

Females displayed more maxillary anterior teeth as compared to males at smiling and rest. With advancing age, the display of maxillary anterior teeth decreased during smiling, speech and rest.

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