



# A Study To Evaluate The Correlation Between The Upper Lip Length And Philtrum Height, To The Size Of The Maxillary Central Incisors In Local Population

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## ABSTRACT

**Background and objective:** The selection of size of maxillary central incisor during prosthodontic rehabilitation in local population is important as central incisors are prominent teeth in anterior region. This article statistically analyze if the relationship of upper lip length and philtrum height has any correlation with the size of maxillary right central incisor in dentate patients. **Materials & Method:** 60 subjects with 30 males and 30 females belonging to the local population under the age group of 21 to 30 years with full complement of teeth were randomly selected. The upper lip length, philtrum height and vermilion was measured using a modified plastic ruler and manual vernier caliper. The dimensions of maxillary right central incisor were determined by a standardized method using digital vernier caliper. **Results:** In female subjects the central incisor height is highly significant with the upper lip length and maxillary right central incisor height is significant with the philtrum height and vermilion height. **Conclusion:** in the study, the philtrum height can be used as a guide in selecting the maxillary right central incisor and the upper lip length can also be used in selecting maxillary right central incisor height in females. The vermilion height can also be used as a guide in selecting the maxillary central incisor height in male subjects.

## I. INTRODUCTION

Esthetics have been a prime focus for both dentist and the patient during the process of fabricating prosthesis<sup>1</sup>. The natural teeth positioning in the mouth and their size provide an adequate guide for the dentist while constructing prosthesis<sup>2</sup>. The most important tooth in selection of size of anterior teeth is maxillary central incisors since it is visible to a casual observer in static facial commotion and reflects the patients age<sup>3</sup>.

Facial appearance determines one's social acceptance, and therefore, the selection of maxillary anterior teeth must be in proportion with facial measurements to achieve good esthetics<sup>4</sup>. The selection of an appropriate maxillary anterior teeth

is one of the most crucial and difficult aspects of complete denture fabrication. The ratio of facial structures and the correlation between facial dimensions and natural teeth could be used as a guide in selecting denture teeth. People from different ethnic groups may also exhibit varying tooth sizes<sup>5</sup>. In Prosthetic Dentistry, where teeth is being restored to its original morphology, understanding of the tooth size will certainly contrivance in the treatment directed. Therefore, the purpose of this study was to investigate whether to use the facial measurements as guides in selecting the size of maxillary central incisors for prosthetic rehabilitation in edentulous patients of local population.

## II. METHOD :

This study was done on 60 subjects (30 males and 30 females) belonging to the local population of Anjarakandy, Kannur.

**Subjects were selected randomly according to the following criteria:**

- Dentulous and aged 21-30 years.
  - Completely dentate arch with presence or absence of third molar
  - Natural maxillary anterior teeth in good alignment
- Subjects with extensive carious lesion, incisal wear, tooth fracture and gingival hyperplasia of maxillary anterior teeth, midline diastema, restoration of anterior teeth by a complete or partial veneer crown, congenital or facial defects and any anomalies of the teeth and previous orthodontic treatment or orthognathic surgery were excluded.

The subjects were seated in an upright position without the use of headrest, with eyes forward and chin parallel to the floor. Subjects were asked to make normal mouth closure by making them do swallow action. The upper lip length and philtrum height were measured using a transparent modified plastic ruler and Vernier caliper. Philtrum length was measured between the base of the nose and border of upper lip at the midline. The upper lip length was measured between the base of the nose and inferior border of



the upper lip, at the midline. Full exposure of the maxillary central incisors were achieved using cheek retractor. The height and width of maxillary central and lateral incisors were measured using electronic digital Vernier caliper intraorally and the measurements were tabulated. The data was analyzed with IBM SPSS software and paired t-test was used to compare the measurements.

### III. DISCUSSION

Many studies have been done to establish easy and reliable methods for estimating the size of anterior teeth especially central incisors. In those studies they have established a significant correlation between the philtrum height and the length and width of central incisor in male subject. In this study philtrum height, upper lip length and vermilion height have been taken as guide for selecting the size of the right maxillary central incisor. It is an easy method which is reliable for estimating the size of the artificial teeth for edentulous patient even in the absence of pre-extraction records. For this study four parameters were taken namely, philtrum height, upper lip length, vermilion height and dimensions of maxillary right central incisor.

#### PHILTRUM HEIGHT

Philtrum length was defined as the distance from the subnasale landmark to the labiale superius landmark.

#### UPPER LIP LENGTH

The average lip length at rest, measured from subnasale to the most inferior portion of the upper lip at the midline, is about 23mm in males and 20mm in females. Lip length should be approximately equal to the commissure height, which is the vertical measurement between the commissure and a horizontal line from subnasale.

#### VERMILION HEIGHT

The vermilion height is the length between the superior vermilion border and the inferior vermilion border.

#### MAXILLARY CENTRAL INCISOR

The average vertical height of the maxillary central incisor is 10.6mm in males and 9.8mm in females. A short crown can be due to attrition or excessive gingival encroachment.

For the study, age group of 21 – 30 years was preferred as the facial development and incremental growth of cranial base gets completed

by the age of 18 and a proper occlusion is attained by this age as the first and second molars are fully erupted to occlusal plane and after 30 years of age, the chances of loss of tooth structure due to attrition, abrasion, erosion are increased.

In the present study 30 male subjects and female subjects were selected on the exclusion and inclusion criteria from the local population.

The landmarks used were the subnasale point, the upper border of upper vermilion in the midline, the lower border of the upper vermilion in the midline at static position.

The subjects were seated in the upright position without the head rest on a chair to check the measurements required.

Orientation points were marked on the wall behind, to make the inter pupillary line coincide with the line parallel to the floor to standardize the procedure.

The measurements of the philtrum height, upper lip length, vermilion height were measured using manual vernier caliper.

Dimensions of maxillary right central incisor were measured using digital Vernier caliper.

The measurements were then tabulated for the statistical analysis using IBM – SPSS statistics 20.0 (IBM corporation, Armonk, NY, USA).

Descriptive and inferential statistical analysis were carried out in the present study. Result on continuous measurements were presented on Mean  $\pm$  SD. Independent 't' test and Pearson correlation co-efficient was used to find the significance of study parameters between the groups. Level of significance was fixed at  $P < 0.05$  and any value less than or equal to 0.05 was considered to be statistically significant.

### IV. CONCLUSION

According to the present study the philtrum height can be used as a guide in selecting the maxillary right central incisor and the upper lip length can be used in selecting maxillary right central incisor height in females. The vermilion height can also be used as a guide in selecting the maxillary central incisor height in male subjects.

As there is geographical variations and anatomical variations in subjects, further studies are required with more number of subjects and larger population to prove a significant correlation between the facial measurements and anterior teeth dimensions.



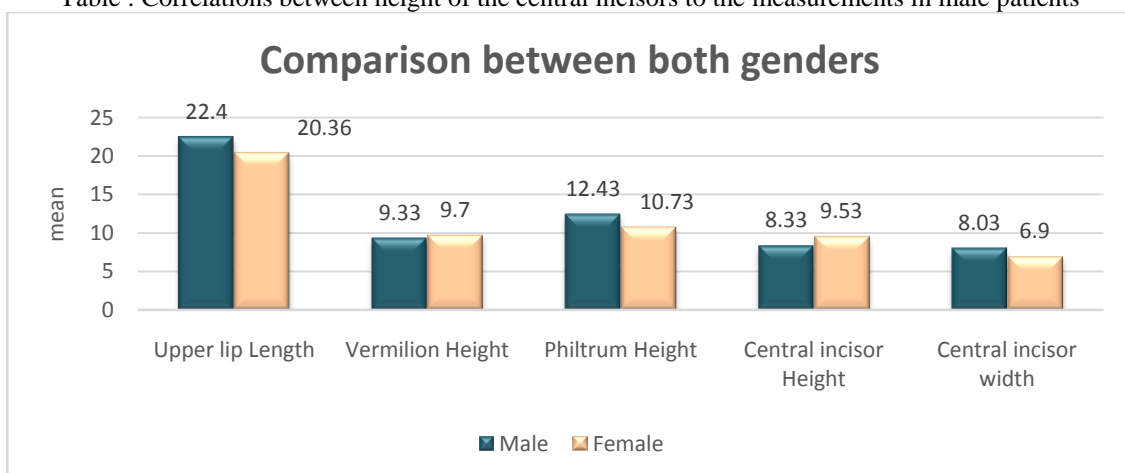
CORRELATION						
		Upper lip Length	Vermilion Height	Philtrum Height	Central incisor Height	Central incisor width
Upper lip Length	Pearson Correlation	1	.462*	.818**	.494**	-.177
	P value		.010	.000	.006	.349
	N	30	30	30	30	30
Vermilion Height	Pearson Correlation	.462*	1	-.023	.295	-.067
	P value	.010		.903	.113	.725
	N	30	30	30	30	30
Philtrum Height	Pearson Correlation	.818**	-.023	1	.409*	-.149
	P value	.000	.903		.025	.430
	N	30	30	30	30	30
Central incisor Height	Pearson Correlation	.494**	.295	.409*	1	.034
	P value	.006	.113	.025		.859
	N	30	30	30	30	30
Central incisor width	Pearson Correlation	-.177	-.067	-.149	.034	1
	P value	.349	.725	.430	.859	
	N	30	30	30	30	30
*. Correlation is significant at the 0.05 level (2-tailed).						
**. Correlation is significant at the 0.01 level (2-tailed).						

Table : Correlations between height of the central incisors to the measurements in female patients



<b>Correlations</b>						
		Upper lip Length	Vermilion Height	Philtrum Height	Central incisor Height	Central incisor width
Upper lip Length	Pearson Correlation	1	.409*	.831**	.074	.331
	P value		.025	.000	.697	.074
	N	30	30	30	30	30
Vermilion Height	Pearson Correlation	.409*	1	-.009	.366*	.375
	P value	.025		.962	.047	.041
	N	30	30	30	30	30
Philtrum Height	Pearson Correlation	.831**	-.009	1	-.140	.176
	P value	.000	.962		.460	.352
	N	30	30	30	30	30
Central incisor Height	Pearson Correlation	.074	.366*	-.140	1	.487
	P value	.697	.047	.460		.006
	N	30	30	30	30	30
Central incisor width	Pearson Correlation	.331	.375	.176	.487	1
	P value	.074	.041	.352	.006	
	N	30	30	30	30	30
*. Correlation is significant at the 0.05 level (2-tailed).						
**. Correlation is significant at the 0.01 level (2-tailed).						

Table : Correlations between height of the central incisors to the measurements in male patients





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