

**UNIVERSITI TEKNOLOGI MARA**

**BIOMETRIC ANALYSIS OF FACIAL  
FEATURES AND ARCH DIMENSIONS OF  
MALAYSIAN MALAY**

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Thesis submitted in fulfillment of the requirements  
for the degree of  
**Master of Dental Science (MDS)**

**Faculty of Dentistry**

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## Candidate's Declaration

I declare that the work in this thesis was carried out in accordance with the regulation of universiti teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This topic has not been submitted to any other academic institution or non academic institution of any other degree or qualification.

In the event that my thesis be found to violate the conditions mentioned above, I voluntary waive the right of conferment of my degree and agree be subjected to the disciplinary rules and regulations of Univesiti Teknologi MARA.

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## ABSTRACT

Many researchers tried to define and prove certain correlation between the different components of biometric, anatomical landmarks and facial features of different ethnic Groups. However, these studies may be specific for an ethnic group and cannot always be applied for others. The aim of this study is to evaluate the biometric and radiographic analysis of the craniofacial skeleton in both genders of Malaysian Malay. The method involved clinical examination, collection and analysis of dental casts and lateral cephalometric radiograph of Malaysian Malay subjects. The total sample was collected from the students of Universiti Teknologi MARA and patients attending the dental clinic of Faculty of Dentistry Universiti Teknologi MARA who fulfilled the inclusion criteria. The study sample consists of 60 subjects from Malaysian Malay pure ethnic groups. The ages ranged between 20- 24 years old, equal from both genders (30 females and 30 males) selected under specific criteria. This study based on comparison of dental arch dimension, skeletal features and facial profile for both genders. These information were gathered from collection and analyzing of orthodontic dental cast for upper and lower arch and lateral cephalometric radiograph. Several points were determined to measure dental arch width, length, depth and circumference. Digital caliper used for the straight measurements on the dental cast and calibrated tape to measure the anterior and posterior arch circumferences. Lateral cephalometric radiograph was taken for each individual by digital cephalometric machine. Using a special software program (VistaDent OC ver. 4.2.61) all cephalometric landmarks were located and determined and subsequently tracing has been done according to Steiner Analysis. Descriptive statistics were described for all the measurements of this study. Statistical comparisons between the groups (Malaysian Malay and Caucasian and other ethnic groups from previous studies) were done using t-test. The results of this study show that the Malaysian Malay maxilla and mandible is set more forward than Caucasian. They also show bimaxillary dental protusion when compared to Caucasian. Malaysian Malay has more protrusive upper and lower lips, the chin is less prominent when compared to Caucasian. Malaysian Malay also have higher cant of both the occlusal and the mandibular planes, mandibular posterior rotation when compared to the Caucasian. They also show sexual dimorphism in dental incisor position. The female has measurably more prominent dento-alveolar structure compared to the male. The upper lip of Malaysian Malay female was set to be more protruded than male. Dental arch dimensions were established in normal occlusion for Malaysian Malay ethnic group in this study. No significant difference was observed in arch dimensions between male and female of Malaysian Malay. The conclusion of this study is that the facial features and dental arch dimensions of Malaysian Malay are notably different from that of Caucasian and other populations. These ethnic differences may be considered during treatment, especially in orthodontics and prosthodontics where facial features and arch dimension can be modified appreciably.

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