Medical Breakthrough of Anthropometric Methods as Basis for 3D Digital Modelling of Indonesian Female Facial Type
(Descriptive-analytic-applied Study)

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(Descriptive-analytic-applied Study)

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Topic: Biotechnology and Biomedical Engineering

Abstract — **Three dimension (3D) face model based on anthropometric data is used as facial plastic surgery simulation, which can be used for setting up a pre-surgery communication between a surgeon and his patient. All this time, Indonesian plastic surgeons have made preoperative and intraoperative evaluation based on the patient's aesthetic sense or desire, and the surgeon's operative technique preferences referring to subjective visual "landmark" and Caucasian parameters instead of referring to parameters of the normal Indonesian face which have not yet been established until now.**

The research objective is creating 3D digital modeling of the Indonesian facial type, which will provide useful reference points speedily, accurately and efficiently, in facial aesthetic and reconstructive plastic surgery and other interdisciplinary fields.

The Methods is an applied study using anthropometric data as basis for formulation of 3D digital modeling of Indonesian facial type, performed 17-25 years old students without history of facial reconstruction and orthodontics. The first step was to distribute questioners to obtain criteria of normal and attractive female faces. Lateral cephalometric, photometric, direct anthropometric and photography were performed. Then the analysis results were applied to 3D modeling programs to make the Indonesian facial type digital geometry overview. Furthermore, the image was interpreted by an expert before concluding the end result.

The results are description of distinguishing parameters between normal and attractive groups by discriminant test included nasal bridge index, binocular width, nasal tip protrusion, mouth width index. According to cephalometry and photometry results, the Indonesian face was more convex than the Caucasian face.

Anthropometric, photometric and lateral cephalometric measurements played a significant role in differentiating the Indonesian face between normal and attractive also from faces of other races. 3D digital woman models can serve as instruments for characterizing normal and attractive faces visually.

Keywords: anthropometric methods, 3D digital modeling, Indonesian female facial type.

BACKGROUND

Face is one of the most important part in humans because it can represent any expression of the human soul itself, even the harmony of each part of the face can affect the overall appearance of a person.[1] Therefore, the changing face due to trauma, congenital or aging processes will cause a disruption in terms of appearance and function. Plastic surgery would be solution for solving this problem.The phenomenon among Indonesian people shows that demand for plastic surgery of the face is higher both in reconstruction and aesthetic surgeries. In fact, the rate of surgical repair of the nose and eyelids are 21.9% of the total percentage of the most popular plastic surgical procedures.[2]

Therefore, proper preoperative adjunct diagnostic procedure and surgical techniques are required to correct the deformity and dysfunction. One of the basic procedures that can be used to achieve optimal results in plastic surgery is obtaining data consisting of pre-operative facial size, shape and occlusal type.[3] Facial animation model is another procedure for operative planning and predicting surgical outcome visually (figure 1). These procedures are commonly used in developed countries.[4,5,6]