COMPARISON OF SPECTROPHOTOMETER, DIGITAL CAMERA AND SCANNER IN REPRODUCING FACIAL SKIN COLOUR

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ABSTRACT

Introduction: The success of a well-fitting and anatomically correct maxillofacial prosthesis is compromised if the colour does not match the adjoining tissues.

Objectives: The purpose of this study was to examine the ability of the spectrophotometer, digital camera and scanner in reproducing skin colour and to create a system of classifying skin colour in a sample of the Malaysian population.

Materials and methods: Two image capturing devices (digital camera and flat-bed scanner) and a colour measuring device (spectrophotometer) were used to characterize the shade of the forehead in 90 adults from 3 ethnic groups in Malaysia – Malays, Chinese and Indians. Their ages ranged from 20-57 years. Readings from the digital camera and scanner were compared to the readings from the spectrophotometer using CIELAB measurements. The skin shade of each subject captured by each of the 3 devices was then printed on matt photographic paper. 4 observers with normal colour vision were allowed 1-2 minutes to match the printed skin shade to the actual shade of each subject's forehead. They were asked to rate each of the printed colour matches as good, acceptable or poor. Data were analysed using descriptive analysis, independent t-test and Chi square test.

Results: The digital camera was assessed to obtain good colour matches in 71.1% of the coloured prints assessed. The digital scanner produced acceptable colour matches in 66.7% of the prints assessed, while 84.4% of the spectrophotometer reproductions were rated as poor. In addition, L*a*b values were different among the three ethnic groups and between gender. The Indian ethnic group had significantly lower L* values (darker shade of skin) than the Chinese who had the highest L* values ($P < .05$) and males had significantly lower L* values than females ($P < .05$). Four shades of skin colour were differentiated among the subjects.

Conclusions: Visual assessment showed that the digital camera reproduction of the skin colour was the closest to the skin shade. The skin shade of the sample of Malaysian population studied may be grouped into dark, medium, fair and light.

Declaration

I certify that this research is based on my own independent work, except where acknowledged in the text or by reference. No part of this work has been submitted for any degree or diploma to this or any other university.

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