Kertas Asli/Original Article

Stature and Sex Estimation Using Foot Measurements for Malays and Chinese in Malaysia
(Pencentuan Ketinggian dan Seks Menggunakan Ukuran-ukuran Kaki bagi Melayu dan Cina di Malaysia)

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ABSTRACT

The aim of this study was to develop formulae for stature and sex estimation using foot length and foot width. A total of 150 subjects ranging in age from 20 to 30 years were recruited from Universiti Kebangsaan Malaysia Kampus Kuala Lumpur (UKM KL). The subjects were Malays (45 males and 45 females) and Chinese (30 males and 30 females). Stature, foot length and foot width were measured using anthropometric instruments in millimetres. Statistical analysis indicated that bilateral variation of various lengths was insignificant for all the foot measurements (Foot length/Fl: t(298) = -0.235, p = 0.815; Foot width/FW: t(298) = 0.932, p = 0.352). Sex differences were found to be highly significant for all the measurements (Stature/S: t(148) = 12.350, p < 0.05; Fl: t(148) = 11.692, p < 0.05; FW: t(148) = 8.321, p < 0.05). Stature was highly significant in Chinese rather than Malay (t(148) = -3.103, p < 0.05) but no significant differences were found in all the foot measurements (Fl: t(148) = 0.002, p = 0.999; FW: t(148) = 1.362, p = 0.175). The highest correlation was found between stature and foot length in all groups. Linear and Multiple Regression Analysis were used to develop formulae for stature estimation. However, the latter was found to be more accurate as the correlation coefficient was highest in the combination of foot length and foot width in all the formulae (S = 585.298 + (4.898 x Fl) - (1.453 x FW), F(2,149) = 149.324, p < 0.01, R² = 0.670). Formulae for sex estimation were obtained by using the Classification Tree Analysis. Result had indicated that sex estimation formulae can help to determine the sex with 86.3-87.5% accuracy in females and 85.2-85.7% accuracy in males by using foot length while the accuracy is 68.4-76.8% in females and 77.8-81.0% in males by using foot width.

Keywords: Stature, sex, foot length, foot width, forensic anthropology