Predicting handgrip power of young adult population among major ethnic groups of Sabah: A multivariate analysis

ABSTRACT

Handgrip power is an essential indicator of health, vital for grasping or gripping sports, and crucial for providing information related to work capacity. The present study investigated any linear relationship of handgrip power with hand anthropometric variables (hand length, handbreadth, middle finger length, second inter-crease length of the middle finger, and hand span), gender, and ethnicity in young adults of Sabah. In this cross-sectional study (from January 2020 to December 2021), the adult Sabahan population (18-25 years) was stratified into four ethnicities (KadazanDusun, Bajau, Malay, and Chinese) and was further stratified as males and females. Then, 46 subjects were randomly selected from each gender, and the ethnic group met the intended sample size. The hand dimensions were measured using a digital calliper, and the handgrip power was measured using a portable dynamometer. The relationship between the response variable and explanatory variables was analyzed at first through simple linear regression and then multiple linear regression. R2, adjusted R2, and standard errors of the estimates were used to compare different models. Statistical analyses were performed using IBM SPSS Statistics 27 and StatCrunch. The study found a linear relationship between gender, height, hand length, handbreadth, hand span, middle finger length, and second inter-crease length of both hands with the corresponding hand's grip power. The highest percentage (68% and 67%) of handgrip variability was demonstrated by the model predicting handgrip power for right-handed subjects, followed by the general models without stratifying based on hand dominance which was able to explain 63% and 64% of the variability of handgrip power. The study proposes the models for predicted right (RHGP) and left handgrip power (LHGP) of 18 to 25 years old adults from major ethnic groups of Sabah RHGP = − 18.972 − 8.704 Gender + 7.043 Right hand breadth and LHGP = − 11.621 − 9.389 Gender + 5.861 Left hand breadth respectively. The predicted handgrip power would be a key to selecting a better player or a better worker or assessing the prognosis of a disease or the wellbeing of a person. The study can be further expanded to all ethnicities and ages of people of Sabah or even Malaysia.