Prediction of vertical jump height from anthropometric factors in male and female martial arts athletes

Abstract

BACKGROUND: Vertical jump is an index representing leg/kick power. The explosive movement of the kick is the key to scoring in martial arts competitions. It is important to determine factors that influence the vertical jump to help athletes improve their leg power. The objective of the present study is to identify anthropometric factors that influence vertical jump height for male and female martial arts athletes. METHODS: Twenty-nine male and 25 female athletes participated in this study. Participants were Malaysian undergraduate students whose ages ranged from 18 to 24 years old. Their heights were measured using a stadiometer. The subjects were weighted using digital scale. Body mass index was calculated by kg/m(2). Waist-hip ratio was measured from the ratio of waist to hip circumferences. Body fat % was obtained from the sum of four skinfold thickness using Harpenden callipers. The highest vertical jump from a stationary standing position was recorded. The maximum grip was recorded using a dynamometer. For standing back strength, the maximum pull upwards using a handle bar was recorded. Multiple linear regression was used to obtain the relationship between vertical jump height and explanatory variables with gender effect. RESULTS: Body fat % has a significant negative relationship with vertical jump height (P < 0.001). The effect of gender is significant (P < 0.001): on average, males jumped 26% higher than females did. CONCLUSION: Vertical jump height of martial arts athletes can be predicted by body fat %. The vertical jump for male is higher than for their female counterparts. Reducing body fat by proper dietary planning will help to improve leg power.