ABSTRACT

FATMAH. Predictive Equations for Estimation of Stature in Javanese Elderly People based on Knee Height, Arm Span, and Sitting Height. Under the direction of HARDINSYAH, BOEDHIHARTONO, and TRIBOEDHI S.

Height is an important clinical indicator to derive body mass index (BMI) predicting the nutritional status of elderly. However, height measurement in the elderly may impose some difficulties and the reliability is doubtful. Equation estimating height from knee height parameter to predict stature in elderly i.e. Chumlea equation have been developed in European, but it could not be applied in Indonesian elderly due to inaccuracy of the result and the difference of stature. The objective of this study was to develop statistical model using knee height, arm span, sitting height; to analyze the correlation between height and underlying factors i.e. areas, age, sex, physical activity level, economic level, occupational physical activity level, bone mineral density (osteoporosis), and body fat (percentage and visceral fat). There were 812 healthy Javanese elderly people (295 males, and 517 females), aged 55 to 85 years old in the six places (Surabaya, Magetan, Yogyakarta, Gunung Kidul, Semarang, and Wonogiri) who participated in this cross sectional study. Standing height, weight, knee height, arm span, sitting height, bone mass density, and body fat were measured. Standing height is an ideal technique for estimating the stature of elderly people, but in cases it was not to be measured. It can be estimated from proxy indicators of stature. Linear regression analysis was carried out to derive predictive equations for estimation of stature with elderly height as the dependant variable and knee height, arm span, and sitting height as independent variables, according to gender. The Chumlea equation tended to be over-estimate in stature of elderly men (2.78 cm), and elderly women (4.90 cm). In this study, arm span showed the strongest correlation with standing height on elderly men (r = 0.815), and elderly women (r = 0.754). There was a significant difference of stature in urban and rural areas and economic level (p<0.05). Advancing age was associated with decreased mean of height, weight, arm span, and sitting height both on elderly male and female, but not on knee height (p < 0.01). In conclusions arm span has the highest validity to predict height on healthy Javanese elderly people. The correlation coefficient of arm span to actual height was a little bit larger on elderly male than on female. It should be borne in mind that equation derived from taller stature populations (e.g. Chumlea from Caucasians ethnic) may be less accurate when applied to shorter stature populations. The study showed that height had significant correlation with bone density in female elderly, and visceral fat in both sex of elderly.

Key words: height, knee height, arm span, sitting height, Chumlea