Older Adult Stunting in Guatemala, Assessed with Total vs. Knee Height Adjusted Stature

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INTRODUCTION

Stunted adults have higher risk for chronic diseases, but scarce information on its prevalence exists in Guatemala. Nutritional and environmental factors, among others, contribute to growth of an individual. Early life affects growth more than adult growth. Leg length has been shown to be a marker of the quality of early living conditions and good living conditions lead to relatively taller legs.

Survey evidence shows that a large proportion of the Guatemalan child population is stunted. However, few studies have examined the prevalence of stunting in adults and its implications in health and well-being. Estimations of adult stunting with measures of total height could lead to inaccurate estimations due to senescent changes in inter-vertebral space and curvature in the aging trunk. Therefore, as an alternative to estimate total height, body segment proportions such as armspan and knee height have been used to correct total height. In this study, we focused on measuring total knee height in a sample of Guatemalan adults. We then connected total height with the measurements of knee height and examined the differences in prevalence of stunting with those two estimations estimates.

OBJECTIVES

Our aim was to assess prevalence of stunting estimations using total vs. height adjusted with knee height (KH) in older (>60 y) Guatemalan adults. We also aimed at estimating body mass index (BMI, kg/m2) with both sets of height estimators.

METHODS

Study Sample: 52 men and 72 women (n=124) from Quetzaltenango City, were recruited for the study. 50 men and 64 women completed all measurements.

Anthropometric Measures:
- Total Height (TH) (cm)
- Knee Height, KH (cm) – thigh/leg and leg/foot at 90°
- Weight (kg)

Anthropometric Estimates:
- Body mass index – BMI=kg/m2
- Estimated total height using knee height, with thigh/leg and leg/foot at 90°

Equations for TH, from KH (Rets: Bermudez 1999)
Males = 69.11+(1.84*knee height cm)-(0.033*age)
Females= 72.06+(1.84*knee height cm)-(0.131*age)

Adult stunting defined as:
Women: <145cm
Men: <150 cm

Analysis:
T-tests and correlation models to assess differences in:
- Stunting prevalence using TH or KH
- BMI (kg/m2) estimates using either TH or KH

RESULTS

DEMOGRAPHICS

PREVALENCE OF STUNTING

CONCLUSIONS

- Estimates of stature with standing height and from knee height estimates were not significantly different.
- Women, as compared to men, had higher rates of stunting, and probably relatively shorter legs to their trunks.
- BMI from standing height and from knee height estimates were all significantly correlated with each other
- Average BMI in women was above normal.
- These findings are relevant and require correction at earlier life stages, as adult stunting and obesity are linked to adversities in survival, adult-health, learning-capacity and physical productivity.
- Stunted adults have higher risk for chronic diseases, but scarce information on its prevalence exists for Guatemala

DISCUSSION

- The degree of height loss found in our study would account for an artifactual increase in BMI of approximately 0.7 kg/m2 for men and 1.6 kg/m2 for women by age 70 years, which increases to 1.4 and 2.6 kg/m2, respectively, by age 90 years.
- True height loss with aging may be taken into account when height (or indexes based on height) is used in epidemiological or clinical studies.
- In poorer, less nourished populations where manual labor is very common with heavy weight bearing, one might hypothesize resistance to a decrease in height and therefore less overestimation of BMI.

FINAL COMMENTS

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