

Title: Validation of school based anthropometric measures and physical fitness among children in Denmark.

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Keywords

School-based health monitoring, anthropometry, cardiorespiratory fitness, reliability

Abstract

Aim: To assess the stability and objectivity reliability of school based measures of anthropometry and physical fitness collected by teachers.

Methods The Healthy School Network (HSN) was initiated in 2009 by the Rockwool foundation to monitor indicators of children's health and provide the basis for health promoting initiatives. Teachers in 183 schools (of 2.425 in 2011 = 7.5%, and 272 schools of 2.299 in 2012 =11.8%), obtained measures of height, weight, waist circumference (WC), Sargent's vertical jump and cardiorespiratory fitness (CRF) among children in grades 0 to 9. Snowball sampling was used to recruit schools. Stability reliability was assessed by comparing results with schools own control measures of 635 children in 50 schools collected in 2011

(n = 700 for 35 schools in 2012), two weeks apart. Objectivity was assessed by comparing results of tests conducted by researchers from University of Southern Denmark (SDU) with schools results on a sample of 111 children. Also, objectivity reliability was assessed by comparing results from health nurses with schools results on 197 randomly selected children. Reliability was assessed by calculation of the concordance correlation coefficient (ρ_c), separately by grades.

Results: High stability reliability was observed for measures obtained in 2011 for height ($\rho_c = 0.92$), weight ($\rho_c = 0.96$), WC ($\rho_c = 0.87$) and Sargent's jump ($\rho_c = 0.86$) and for CRF ($\rho_c = 0.83$). Estimates of similar size were observed for measures obtained in 2012. Objectivity reliability was high for measures of height ($\rho_c = 0.97$), and weight ($\rho_c = 0.94$), and moderate for WC ($\rho_c = 0.81$), and Sargent's jump ($\rho_c = 0.71$), and low for CRF ($\rho_c = 0.18$). Objectivity reliability for measures obtained by school nurses and schools in a subset of the HSN study in the municipality of Odense was high for height ($\rho_c = 0.99$), weight ($\rho_c = 0.99$) and WC ($\rho_c = 0.91$).

Conclusions: Schoolteachers can provide reliable measures of children's height, weight, and are able to reproduce measures of WC but needs additional training in measuring vertical jump and CRF.

Implications School-based monitoring of children's anthropometry and fitness is feasible and can provide a foundation for health promoting initiatives

Key references

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