Validation of a BMI cut-off point to predict an adverse cardiometabolic profile

with adiposity measurements by dual-energy X-ray absorptiometry in Guatemalan

children.

Redondo O(1), Villamor E(2), Valdés J(3), Bilal U(1), Caballero B(4), Roche D(5),

Kroker F(5), Ramírez-Zea M(5), Franco M(1).

Author information:

(1)1Social and Cardiovascular Epidemiology Research Group,School of

Medicine,University of Alcalá,Alcalá de Henares,Madrid 28871,Spain.

(2)3Department of Epidemiology,School of Public Health,University of Michigan,Ann

Arbor,MI,USA.

(3)4Department of Public Health, Medical Faculty,Catholic University of the

North,Santiago de Chile,Chile.

(4)6Center for Human Nutrition,Department of International Health,Johns Hopkins

Bloomberg School of Public Health,Baltimore,MD,USA.

(5)7INCAP Comprehensive Center for the Prevention of Chronic Diseases

(CIIPEC),Institute of Nutrition of Central America and Panama (INCAP),Guatemala

1188,Central America.

OBJECTIVE: To identify a body fat percentage (%BF) threshold related to an

adverse cardiometabolic profile and its surrogate BMI cut-off point.

DESIGN: Cross-sectional study.

SETTING: Two public schools in poor urban areas on the outskirts of Guatemala City.

SUBJECTS: A convenience sample of ninety-three healthy, prepubertal, Ladino children (aged 7-12 years).

RESULTS: Spearman correlations of cardiometabolic parameters were higher with %BF than with BMI-for-age Z-score. BMI-for-age Z-score and %BF were highly correlated (r=0·84). The %BF threshold that maximized sensitivity and specificity for predicting an adverse cardiometabolic profile (elevated homeostasis model assessment-insulin resistance index and/or total cholesterol:HDL-cholesterol ratio) according to receiver operating characteristic curve analysis was 36 %. The BMI-for-age Z-score cut-off point that maximized the prediction of BF ≥ 36 % by the same procedure was 1·5. The area under the curve (AUC) for %BF and for BMI data showed excellent accuracy to predict an adverse cardiometabolic profile (AUC 0·93 (sd 0·04)) and excess adiposity (AUC 0·95 (sd 0·02)).

CONCLUSIONS: Since BMI standards have limitations in screening for adiposity, specific cut-off points based on ethnic-/sex- and age-specific %BF thresholds are needed to better predict an adverse cardiometabolic profile.