

# Pengukuran antropometri dan hubungannya dengan "golden standard" persen lemak tubuh, bioelectrical impedance analysis : studi validasi pada anak sekolah dasar tahun 2010 = Anthropometric measurements and its correlations with percentage body fat, bioelectrical impedance analysis as "golden standard" : a validation study in elementary schools children , 2010

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## Abstrak

Tujuan penelitian ini adalah untuk mengetahui korelasi pengukuran antropometri Lingkar Pinggang, IMT, RLPP, dan Skinfold Thickness dengan persen lemak tubuh BIA sebagai "Golden Standard". Beberapa studi telah menghasilkan rumus prediksi lemak tubuh dengan pengukuran IMT dan Skinfold, serta menetapkan batasan gizi lebih untuk populasi anak di Asia. Dalam penelitian ini juga dievaluasi rumus prediksi dan cut-off point yang paling tepat digunakan untuk populasi anak di Indonesia. Penelitian dilakukan pada 157 anak dari SD Vianney dan SD Mardi Yuana di Jakarta dan Depok pada tahun 2010 yang menunjukkan prevalensi gizi lebih di atas 20%.

Studi validasi ini menggunakan pendekatan kuantitatif dengan desain penelitian cross sectional.

Pengambilan sampel menggunakan rumus uji koefisien korelasi. Alat yang digunakan untuk mengukur Lingkar Pinggang dan RLPP adalah pita meter non-elastis, untuk pengukuran IMT yaitu dengan microtoise dan timbangan SECA, serta caliper Harpenden untuk mengukur Skinfold Thickness. Setiap pengukuran dilakukan dua kali. Analisis yang dilakukan adalah uji korelasi untuk melihat kekuatan hubungan variabel antropometri dan rumus prediksi dengan persen lemak tubuh, analisis sensitivitas dan spesifisitas cut-off point, uji beda rumus prediksi dengan persen lemak tubuh, dan uji regresi.

Hasil menunjukkan rata-rata Lingkar Pinggang, RLPP, persen lemak tubuh dan tricep skinfold lebih tinggi pada anak laki-laki, dan rata-rata IMT, bicep, dan subscapular lebih tinggi pada anak perempuan. Semua variabel berhubungan kuat dengan persen lemak tubuh BIA, yang paling kuat hubungannya adalah IMT Z score pada anak perempuan dengan  $r = 0.985$ . Rumus prediksi persen lemak tubuh yang memiliki hasil hampir serupa dengan persen lemak tubuh BIA adalah rumus IMT Deurenberg. Cut-off point yang paling baik sensitivitas dan spesifisitasnya adalah cut-off point IMT WHO dengan sensitivitas 79.75% dan spesifisitas 91.03%. Secara umum, IMT lebih baik dalam memprediksi persen lemak tubuh.

The purpose of this study was to evaluate correlation between anthropometric measurement : waist circumference, body mass index (BMI), waist-hip-ratio, and skinfold thickness; and percentage of body fat measured by BIA as a golden standard. Some studies found several equations to predict percentage of body fat from anthropometric measurements like body mass index and skinfold thickness. Previous studies had established cut-off points to define overweight for pediatric population in Asia. In this study, a prediction equation and cut-off point to define overweight would be evaluated as well, the ones which were closer to percentage of body fat BIA, was a better approach and indicator to define overweight in Indonesian children. Data were obtained from 157 children from two different elementary schools, SD Vianney and SD

Mardi Yuana. Both schools had overweight prevalence more than 20%.

Design of this validation study was a cross sectional one with a quantitative approach. Samples were taken by using sampling equation of coefficient correlation. Waist circumference and waist-hip ratio were measured by using non-elastic tape, body mass index was measured by using SECA body scale and microtoise, and skinfold thickness was measured by using Harpenden caliper. Every measurement was taken two times. This study analyzed the strength of correlation between antropometric measurement and percentage body fat BIA, evaluated the sensitivity and spesificity of cut off points to define overweight, and evaluated the difference between prediction equations and BIA.

Results showed that means of waist circumference, waist hip ratio, percentage body fat, and tricep skinfold are higher in boys, whereas, body mass index, bicep and subscapular skinfold were higher in girls. Every variable had a good correlation with percentage body fat BIA. The strongest correlation was between BMI in Z score and percentage body fat BIA in girls with  $r = 0.985$ . The prediction equation that produced similar result with percentage body fat BIA was equation from Deurenberg and the cut-off point that had a highest sensitivity and specficity was standard from WHO, the sensitivity was 79.75% and specificity was 91.03%. Overall, BMI was a good prediction to assess percentage body fat.