

Reply: Vertical segmental tetrapolar bioimpedance for excess body fat assessment in adolescents ☆☆☆



Resposta: Bioimpedanciometria tetrapolar segmentada vertical para a avaliação do excesso de gordura corporal em adolescentes

Dear Editor,

The questions presented by Professor Dr. Roberto Fernandes da Costa and Dr. Edilson Serpeloni Cyrino are relevant and, therefore, we would like to clarify the comments submitted to the Journal.

First, we value scientific discussion, and the questions raised by the esteemed researchers contributed to the understanding of our findings.

As for the question concerning the use of the Biodynamics® device (model 450, WA, USA) as our reference technique, we emphasize that the literature confirms this methodological choice.

As an example, Goncalves et al.¹ found that such equipment had a good predictive capacity in detecting excess body fat in adolescents. In addition, they stated that even with the impossibility of compliance with the measurement protocol, the results also were similar to those of the dual-energy X-ray absorptiometry (DEXA).

Nevertheless, we emphasize that we did not state that the device was used in our research as the gold standard, as we recognize that it has limitations and should not be considered a homologous replacement for the indirect methods: DEXA, hydrostatic weighing, plethysmography, etc.

Also, we did not state that we were validating the Tanita® (BC-558 model; Amsterdam, Netherlands) vertical segmental tetrapolar bioimpedance device. We proposed, on the contrary, to briefly compare it with another device, whose use is supported for adult and pediatric population assessment, in addition to the fact that it is more accessible in clinical practice.²

We also take this opportunity to point out a correction: the fat-free mass of the participants submitted to the examinations was estimated using the equations reported by Chumlea et al. in their study: "Specific resistivity used to estimate fat-free mass from segmental body measures of bioelectric impedance".³ However, we made a mistake in the reference section and cited another publication: "Prediction of body weight for the nonambulatory elderly from anthropometry".⁴

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☆☆ Study carried out at Department of Nutrition, Instituto de Ciências Biológicas, Universidade Federal de Juiz de Fora (UFJF), Juiz de Fora, MG, Brazil.

Regarding the statistical analysis, we used a stringent sampling procedure and data that met specific requirements, namely: (a) the dependent variables were quantitative and continuous, and were measured in at least one interval scale; (b) there was homoscedasticity based on Levene's test (homogeneity of variance); (c) the sample size was large and came from a population with normal distribution. We believe, therefore, that there was agreement with the central limit theorem.

It is noteworthy that especially for large samples, the parametric tests (Student's *t*-test and ANOVA) are more sensitive and have a more robust behavior even when the distribution of the study variable shows heteroscedasticity and is demonstrably not the normal type.⁵

Therefore, the use of non-parametric tests, when the assumptions are not valid, even though traditional, is not the only strategy of analysis.⁵

Additionally, aiming to clarify the uncertainties that could still persist for the professors, authors of the letter, or other readers, we applied the Kolmogorov–Smirnov test and then repeated the bivariate analyses, submitting the variables considered as non-parametric to the Mann–Whitney *U* test. As a result, the interpretations of the significances remained equivalent to those recorded in the study.

Nevertheless, the focus of our investigation was directed at the receiver operating characteristic (ROC) curves, and the parametric or non-parametric considerations did not impair our aims.

Regarding the positive and negative predictive values, we agree with the comment that a post-test probability analysis would substantially complement the results found.

Considering our justifications, we hope that this discussion will contribute to clarify the efficacy of vertical segmental tetrapolar bioimpedance, and encourage further studies that will address the same subject.

In conclusion, we kindly thank the professors who were willing to evaluate our work.

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Conflicts of interest

The authors declare no conflicts of interest.

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