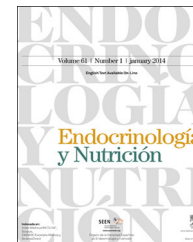




# ENDOCRINOLOGÍA Y NUTRICIÓN

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## LETTERS TO THE EDITOR

### **Reference values of waist circumference and waist/hip ratio in children and adolescents of Mérida, Venezuela**<sup>☆</sup>



### **Valores de referencia de la circunferencia de la cintura e índice de la cintura/cadera en escolares y adolescentes de Mérida, Venezuela**

Sir,

We have read with interest the article by Mederico et al.<sup>1</sup> reporting the search for regional reference values for waist circumference and waist/hip ratio in children and adolescents of the city of Mérida, Venezuela, and comparing them with international references. While we agree on the importance of studies of this type,<sup>2,3</sup> we think it is worthwhile to review and discuss some methodological, statistical, and conceptual aspects regarding the internal and external validity of their findings and their implications at national and international level.

It should first be noted that the study title refers to reference values from a Venezuelan state (the main territorial unit of the country) and compares them to international and national references. This may confuse readers, because the abstract already speaks about “regional” reference values, when they were actually collected in a state, rather than a region (which would encompass several states). In Venezuela, this may be mistaken for the Andes region, including the states of Mérida, Táchira, and Trujillo.

On the other hand, for those who do not know the geography of the Venezuelan state of Mérida, the title would suggest that a representative sample of that state was studied when, in fact, only children and adolescents aged 9–18 years from one of the 23 municipalities of the state (Municipio Libertador) were passively studied (because this was not a study actively searching for subjects on a home by

home basis). Since none of the other municipalities are represented in the study, it should not be considered that the values are generalizable to the rest of the state by calling them regional values, especially given that there are great differences in socioeconomic conditions. The 2001 census of the municipality estimated that 18.1% of the population lived in poverty (2.3% in extreme poverty) but, for example, in the municipality Justo Briceño in the same state of Mérida the corresponding figures for the same year were 69.3% and 35.9% (3.9 and 15 times higher) respectively.<sup>4</sup>

Moreover, the study did not even include the whole metropolitan area of the state, which comprises, in addition to Municipio Libertador where Mérida is located, the municipalities of Campo Elías, Santos Marquina, and Sucre, with a total population of 504,666 inhabitants according to data from the 2011 census of the National Statistic Institute of Venezuela. As these other municipalities were not included, the study only focused on Mérida, which has a total population of 330,821 inhabitants according to the same census.<sup>5</sup> Both the title and other parts of the study are confusing because mention is made of schoolchildren and adolescents, when the population assessed was aged 9–18 years and the population of “school age”, which is how it should be called, starts at 5 or 6 years depending on the classification being used, but never at 9 years.

From the statistical and epidemiological viewpoint, we wonder whether the authors are justified in calling a reference sample one that was not selected at random, with every subject aged 9–18 years living in the city of Mérida having the same chance of being selected. Was probabilistic sampling used? Although the authors state that “The sample was selected using proportional stratified, multistage random sampling that guaranteed adequate participation by sex, public or private institution (socioeconomic level), and geographical location”, they do not detail the methods used to estimate sample size, random error, beta error, *a priori* power, and *post hoc* power. The type of study conducted is not clearly defined in either the abstract or the Material and Methods section.

The total population aged 9–18 years in the city of Mérida is 32,650. What criteria were used to select the 927 participants? How was the conclusion that the eight public schools and five private schools selected were a representative sample of the population reached? There is no specific reference to the randomization of such units, but of subjects. Similarly, a study conducted in Colombia in 2011 in the municipality of Pereira, located in the department (the equivalent to a Venezuelan state) of Risaralda, which was not

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intended to generate reference values, but to ascertain the prevalence of overall, acute, and chronic malnutrition in a population of 69,875 children less than 10 years of age, assessed a representative sample of 1516 subjects selected at random.<sup>6</sup>

While we agree that childhood obesity is an increasing problem, the statement in the study introduction that "The prevalence of childhood obesity has tripled since the 1970s and it is now considered to be one of the most serious public health challenges of the 21st century" is not supported by any of the multiple references which could have been cited on a subject of increasing interest in the international literature.<sup>7</sup> A comment should be made on the references cited in the article. For example, after stating that "the use of WC is currently recommended for the diagnosis of central obesity in children", the authors refer to an article published in 1996.<sup>8</sup> Research studies of interest on large populations (1,066,864 adolescents of both sexes) have recently been conducted in Venezuela.<sup>2</sup>

From the anthropological viewpoint, we would also like to express our disagreement with the term "races" used in the article. We think that there are no different human races,<sup>9</sup> and do not agree either with the statement that "Genetic (sexual maturation and race) and environmental factors are involved in body fat increase and, particularly, in fat distribution." The variables given in brackets are not genetic factors, but maybe rather the presence of thrifty or other genes. Sexual maturity does not depend on genetic factors alone. The article states that differences have been found between "Hispanics, Caucasians, and Blacks", but the first group corresponds to a region of the world, while the other two refer to skin colors.

Based on all of the foregoing, caution is required with regard to the perspectives, implications, and scope of research studies which may have methodological and conceptual limitations and regarding which we need to verify whether the primary objective has actually been met and the study results can in fact be reliably used for such a complex task as the generating of anthropometric reference values for the population, which is undoubtedly a clear need for countries not having such data, such as Colombia and many other Latin American countries. National reference values are only currently available for Venezuela, Cuba, Brazil, and Argentina.<sup>3</sup>

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