

GROWTH ASSESSMENT IN SCHOOL-CHILDREN OF VILLA CUBAS, CATAMARCA ARGENTINE.

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ABSTRACT

An anthropometric study of the growth in schoolchildren aged 5 to 14 years, belonging to the Villa Cubas district of the capital of the province of Catamarca, has been carried out. Villa Cubas presents average/low socioeconomic characteristics and is situated in a peripheral sector to the Center of the Capital. Male and female students have been evaluated. The measurements were turned to "Z" scores. The aims of this work were: 1) To determinate the state of growth in comparison with the national reference standards and 2) To analyze the competence of the use of such standards in the clinical and nutrition assessment in the province of Catamarca. The results showed that the body weight and height had no difference with the standards, while the sitting presented higher values than the standards. The results are interpreted as a consequence of the food deficit that affected the height and the inferior height part. The standards of reference are considered to be out-of-date and inappropriate for the clinic assessment in the province of Catamarca, inasmuch as they do not show the changes that have taken place in the population in the last 20 years.

Key words: anthropometry - Catamarca - human growth - school children - standards - height - weight.

INTRODUCTION

Villa Cubas is an old population peripheral to the capital city of Catamarca, which bears the same name, constituent part of the Northwest of Argentina. It is placed in an urban area, at 500 m above sea level. This old neighborhood, originally called Village of the Poor, was created in 1886 to the West of the City so as to be inhabited by poor families. The neighborhood is part of the area known as Villa Cubas. It presents socioeconomic characteristics of middle and lower classes. It is the most highly populated peripheral neighborhood, with a population of 13.889 inhabitants that represents 12.7% of the total of the Capital Department. It is only surpassed by the population of Catamarca City's downtown (8). Although Villa Cubas offers all facilities, is placed very near downtown, has effective mass media, it has not succeeded in improving the marginal condition of its inhabitants, mainly due to the low wages of the people, the poor working conditions such as unemployment, and underemployment, which are present at varying degrees. In relation to child growth in urban areas it has been shown that, if the urban conditions are present (in virtue of the socioeconomic state of the family, good homes, good education and probably good nutrition), children get close to the 50 percentile of the standards of growth in the developing countries (3). But in most cases these conditions are absent; so that certain cases in urban areas have registered values of

body weight and height inferior even to the measures of children in rural areas (18, 17, 21).

The reference standards are tools of great utility in the assessment of growth and nutrition state and by extension in the determination of groups in nutrition risks and in fact they are used in different regions of our country, thus, in the province of Catamarca the nutrition assessment that is carried out in the health-service centres is based fundamentally on body weight and standing height by contrast with the curves of national reference (11) which are available in pediatric clinics and printed in a personal health book that registers the periodic development of the child. Based on the principle that each population is adapted to its own environmental conditions, different works pose the need of developing local standards. It has also been discussed in detail the need of a periodical updating of the standards, specially in the developing countries. In other countries of the world, some growth standards have already been declared obsolete (19), while others are very near the end of their useful lives, thus stating the need for new standards for the nineties and following years since the proportion on nutrition risk may be underestimated when out-of-date standards are used (16).

The present work is part of a project that intends to update the data of the growth in schoolchildren of the Province (the last available information dates from 1982) (12). In this work the results that were acquired from students of Villa Cubas were analyzed, with the aim of deciding: a) if there are differences in the growth related to the national reference standards at present in use; b) the competence of the use of standards in the clinic and nutrition assessment of children.

MATERIALS AND METHODS

For this work different measures have been taken, body weight (BW), standing height (SH1) and sitting height (SH2), from schoolchildren aged from 5 to 14 years, belonging to the peripheral sector of the Capital City of Catamarca named Villa Cubas; such measures were obtained between June and August, 1993, by the observer (EVS) and following the advices of

Lejarraga et al (9). The chronological age was determined as from the sixth month of the foregoing date till the fifth month of the after date for each group of the same place.

The averages and standard deviations of the three variables and percentile 25,50 and 75 of the WB and SH1 variables have been obtained out of a total of 740 children, 388 male and 352 female. The national standards were used in order to compare the BW and SH1. In turn the measurements of the three variables were turned into "Z" using for that purpose the National Standards (11) for WB and SH1 and Cusminsky et al (4) for SH2, with which they were compared.

RESULTS

It is possible to see in Tables I and II the distribution of the sample (n), the averages (x) and the standard deviations (DS) of the variables studied in males and females of Villa Cubas.

Table I: Sample size (n), average (X) and standard deviations (DS) on males of Villa Cubas. Variables: Weight (BW), Standing height (SH1) and Sitting height (SH2)

AGE	(n)	BW (Kg)		SH1 (cm)		SH2 (cm)	
		X	DS	X	DS	X	DS
5	28	19.1	3.6	110.0	5.3	60.6	3.0
6	54	20.2	3.0	113.7	5.0	62.9	2.8
7	38	21.8	2.9	118.6	5.2	64.4	3.1
8	27	26.8	5.4	126.4	5.3	67.5	2.7
9	43	29.6	6.1	128.3	6.0	69.7	3.3
10	56	32.1	7.3	135.0	6.4	71.4	3.0
11	44	36.4	6.8	140.5	5.9	74.1	2.7
12	48	38.1	7.7	144.8	8.9	75.9	4.8
13	34	42.1	7.6	150.1	6.2	77.8	4.1
14	16	47.9	8.3	157.7	9.8	82.7	4.6

When the percentile 25,50 and 75 of the variables BW and SH1 were compared they turned out to be similar to the national standards of growth agreeing in almost all the ages



Table II: Sample size (n), average (X) and standard deviations (DS) on females of Villa Cubas.

Variables: Weight (BW), Standing height (SH1) and Sitting height (SH2)

AGE	n	BW (Kg)		SH1 (cm)		SH2 (cm)	
		X	DS	X	DS	X	DS
5	21	18.3	3.1	108.2	4.1	59.3	2.6
6	37	20.0	3.2	113.6	6.5	61.6	3.1
7	43	21.5	3.3	118.6	5.9	63.9	2.8
8	26	25.9	6.7	125.1	6.6	66.8	3.3
9	46	27.9	4.8	130.9	6.4	68.3	3.2
10	29	31.8	6.4	136.4	6.7	71.5	3.7
11	47	37.0	8.2	142.7	7.3	74.4	3.8
12	57	40.4	9.5	146.9	9.0	78.1	4.8
13	32	47.1	9.0	152.0	6.5	80.0	4.0
14	14	48.4	8.5	152.9	7.2	81.0	3.8

of the percentile 50 of the schoolchildren of Villa Cubas with the percentile 50 of the standards, in males (Figs. 1 and 2) as well as in females (Figs. 3 and 4). The comparison of "Z" of the variables BW, SH1 and SH2 with the values of the standards showed that the BW and the SH1 intercrossed with line 0 belonging to the standard and in some cases it is clearly inferior, while in the case of SH2 it is possible to see that in all the ages there are superior values to the standard. The results were similar in males (Fig. 5) and females (Fig. 6).

DISCUSSION

From the contrasting analysis of the percentiles of Villa Cubas with the national standards it follows that there is an absence of differences between the BW and the SH1. This *prima facie* can be interpreted by taking into account that the children of Villa Cubas have reached a good growth level and their nutritious state is normal, since their body measures are very similar to the standard ones.

In previous works (12, 14, 15) it was noticed that schoolchildren in peripheral sectors of Catamarca, studied in 1982, presented medium values of weight and standing height much inferior to the standard values.

The similarity found in 1993 can be interpreted as the result of the improvement in the nutritious situation and in the health of the whole child population of that sector. As a matter of fact positive century-old changes have been found in weight and height in schoolchildren of peripheral sectors between 1982 and 1993 (13, 16). However, it would be risky to conclude stating that the students have reached a good growth and nutritious state, if we take into account the comparison made in "Z" score, which allowed to visualize the behavior of the three variables simultaneously. The BW and the SH1 presented values that intercrossed with the corresponding standards; the SH2 had values superior to those corresponding to the standards in all the ages and in both sexes. This height portion is an indicator of the growth in the trunk and in the encephalic portion. In cases of malnutrition it is common to find somewhat altered the dimensions of weight and standing height and not the sitting height, since even in conditions of nutritious shortage the body delivers protective mechanisms (7).

The environmental conditions in developing countries may change rapidly.

For this reason the comparisons with growth studies carried out in developing countries have to be carefully handled (20), since present-day children may be vitally bigger than those of 20 years ago. This leads to speculations that century-old changes may have also occurred in other sectors of the country's population, which are showed in the available standards. According to Garn (6) in the occidental world the magnitude of the century-old tendencies requires up-to-date of the standards used in the nutritious assessment and besides, Vanloon and assistants (22) have agreed that the selection by anthropometric variables of undernourished children only can be made satisfactorily with "local standards" in the different communities of the third world. The occurrence of century-old changes in weight and height have been observed in different Argentine populations (1, 2, 5, 10, 13, 16). On the other hand, the growth national standards, specially the strip that extends from birth till the age of 12 have the data that was obtained

between 1966 and 1975. The use of this obsolete information could lead to the error of considering as well nourished an important number of children that in fact are in nutritious risk.

The obtained results show us on one side the effective improvement of the peripheral sectors in relation to health care, schooling, house situation, etc.; which have eradicated the differences present in past times in regard to the growth national standards, whereas the sitting height presented values superior to the mean of the national standards, this may be pointing out that probably the population under investigation is undergoing nutritious deficiencies that affect chiefly the dimensions of weight and standing height, but not the height's suprapubic segment.

On the other hand there arises the need of updating the growth standards, since the data used for their elaboration are much older than 20 years and by considering the opinion of their own authors it is advisable the construction of new standards every 10 years, with the purpose that such standards show the secular changes that take place in the developing countries, or to promote the elaboration of local tables periodically renewed, so the representation may be applied to all the population's sectors under investigation. The nutritious assessment at institutional level based on the national standards nowadays in use represents a potential risk, since the proportion of nutritious risk may be underestimated, because the assessed groups are considered as having a normal growth, when actually they can be in a strip of nutritional assistance programs implemented in most of the countries of the third world with risk, and therefore, may turn out to be excluded the aim of uprooting the child undernourishment.

Although it is wise to carry out the assessment of the growth in comparison with local standards or with the national ones till up-to-date information is obtained, it would be more convenient to use as a way of comparison the international tables of reference.

RESUMEN

Se realizó un estudio antropométrico de

crecimiento en escolares comprendidos entre 5 y 14 años de edad pertenecientes al barrio Villa Cubas de la capital de la provincia de Catamarca. Este barrio presenta características socio-económicas media/baja y se emplaza en un sector periférico al Centro de la Capital. Se evaluaron niños, de sexo masculino y femenino. Se obtuvieron las medidas de peso corporal, estatura total y estatura sentado y se convirtieron todas las mediciones a puntaje "Z". El objetivo del trabajo fue: 1) determinar el estado de crecimiento en relación a los estándares nacionales de referencia y 2) analizar la pertinencia del uso de tales estándares en la evaluación clínica y nutricional en la provincia de Catamarca. Los resultados obtenidos indicaron que el peso corporal y la altura no tuvieron diferencias con los estándares, mientras que la estatura sentado presentó valores superiores a los estándares. Se interpretan los resultados como consecuencia de déficits nutricionales que afectaron más al peso y la posición estatural inferior. Los estándares de referencia se consideran desactualizados e inapropiados para la evaluación clínica en la provincia de Catamarca, ya que no reflejan los cambios seculares ocurridos en la población en los últimos 20 años.

Palabras clave: antropometría - Catamarca - crecimiento humano - escolares - estándares - estatura - peso.

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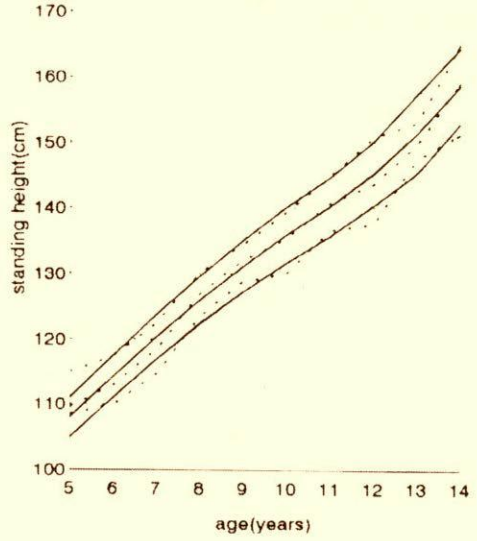
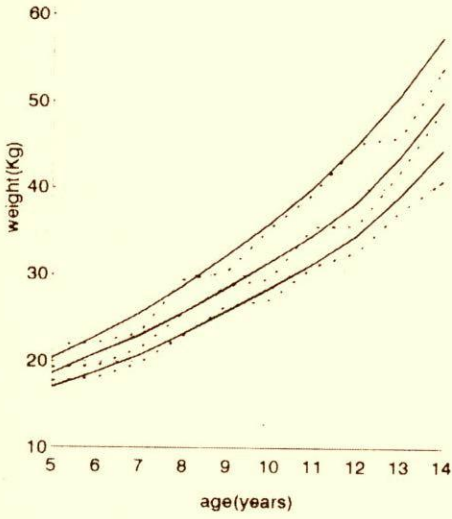


Figure 1: Percentiles 25.50 and 75 of Weigth for males of Villa Cubas (...) compared with National Standards (—)

Figure 2: Percentiles 25.50 and 75 of Standing Heigh for males of Villa Cubas (...) compared with National Standards (—)

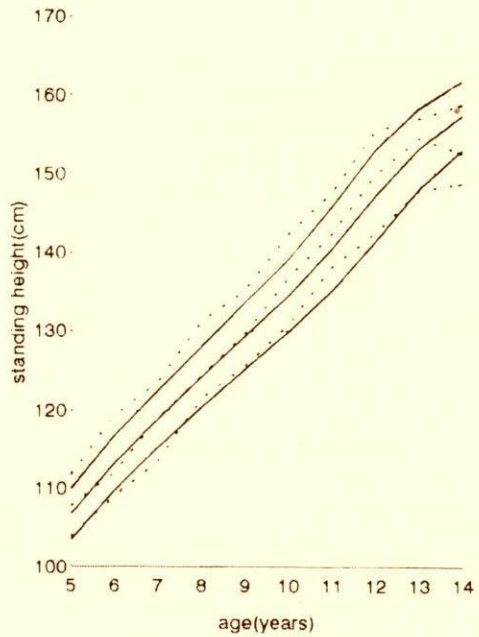
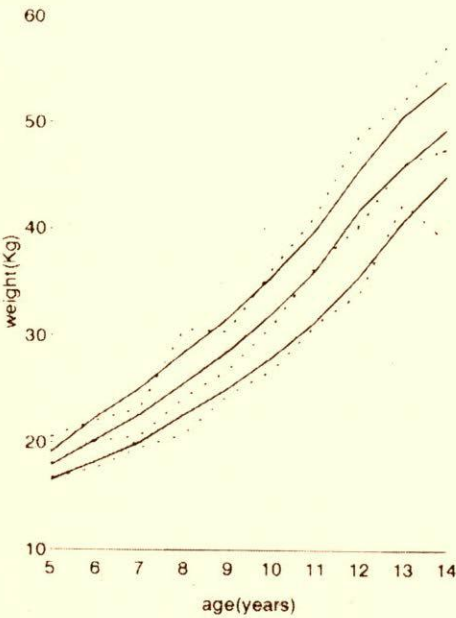


Figure 3: Percentiles 25.50 and 75 of Weigth for females of Villa Cubas (...) compared with National Standards (—)

Figure 4: Percentiles 25.50 and 75 of Standing Heigh for females of Villa Cubas (...) compared with National Standards (—)

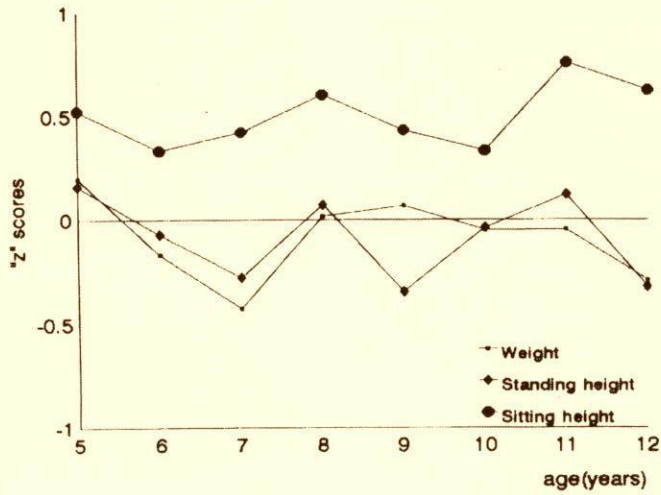


Figure 5: Mean "z" scores for males 5 to 12 years old. Weight, Standing Height and Sitting Height compared with National Standards represented on line 0.

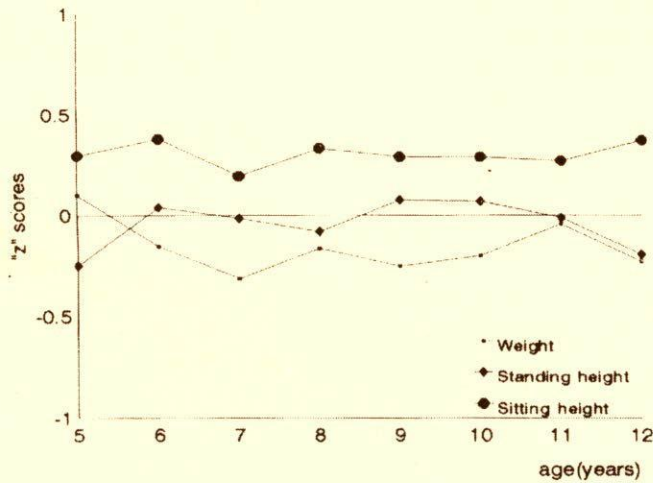


Figure 6: Mean "z" scores for females 5 to 12 years old. Weight, Standing Height and Sitting Height compared with National Standards represented on line 0.