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Nutritional status of children under five years living in area of social vulnerability of Campina Grande, Paraíba State

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ABSTRACT. The nutritional status of children under five years living in an area of social vulnerability and its association with personal and socioeconomic characteristics are evaluated by a cross-sectional study conducted at the Basic Family Health Units (I and II) of the Mutirão district in Campina Grande PB Brazil. Current study included 76 families with under-five-year-old children and any former collector of recyclable materials from the Campina Grande landfill. The nutritional status of children was analyzed by weight / age (W/A), height / age (H/A) and weight / height (W/H) indexes to determine their anthropometric deviations and etiological analyses with children´s socioeconomic characteristics. Prevalence of 6.6% in weight deficit and 19.7% in height deficit were reported. Multivariate linear regression analysis revealed that W/A, H/A and W/H indexes were negatively influenced in cases of children born with low birth weight, in children who had diarrhea during the last 15 days prior to the interview and those who had protozoan parasites during the same period. Height and weight deficits were the most common nutritional disorders. Results emphasize the need to carry out periodic assessments of children´s nutritional status featuring health and socioeconomic characteristics of vulnerability.

Keywords: poverty. health status. primary health care.

Estado nutricional de crianças menores de cinco anos residentes em área de vulnerabilidade social de Campina Grande, Estado da Paraíba

RESUMO. O objetivo deste estudo foi avaliar o estado nutricional de crianças menores de cinco anos residentes em uma localidade de vulnerabilidade social e sua associação com características pessoais e socioeconômicas. Trata-se de um estudo transversal realizado nas UBSF I e II do bairro Mutirão - Campina Grande, Paraíba. Participaram do estudo 76 famílias com crianças menores de cinco anos e algum membro ex-catador de materiais recicláveis do lixão desativado de Campina Grande, Paraíba. O estado nutricional das crianças foi analisado a partir dos índices peso/idade (P/I), estatura/idade (E/I) e peso/estatura (P/E), determinando-se respectivos desvios antropométricos e análises etiológicas com características das crianças e socioeconômicas. Encontrou-se prevalência de déficit de peso de 6,6% e de déficit de estatura de 19,7%. A análise de regressão linear multivariada mostrou que os índices P/I, E/I e P/E estiveram influenciados negativamente nos casos de crianças que nasceram com baixo peso, naquelas que tiveram diarreia nos últimos 15 dias que antecederam à entrevista e nas que apresentaram verminose nesse período. Os déficits de estatura e de peso foram os distúrbios nutricionais mais frequentes. Os resultados alertam a necessidade da realização de avaliações periódicas do estado nutricional de crianças com características de saúde e socioeconômicas de vulnerabilidade.

Palavras-chave: pobreza. nível de saúde. atenção primária à saúde.

Introduction

Contemporary Brazil has a food and nutrition status marked by a long-lasting prevalence of malnutrition (Brasil, 2009) and food insecurity (Instituto Brasileiro de Geografia e Estatística [IBGE], 2010a). Constant reduction of malnutrition cases in Brazil has been attributed to favorable evolution of socioeconomic and health care conditions (Lima et al., 2010; Monteiro et al., 2009) but distinguished by a significant prevalence of stunting associated with living conditions (Instituto Brasileiro de Geografia e Estatística [IBGE], 2010b). Further, the food insecurity of Brazilian families highlights a social condition in which millions of people find themselves without any guarantee of their right to food (Oliveira et al., 2009). In this perspective, the poorest segments of the population should be the focus of public policies on food and nutrition in the country.

In recent years, various public policies have discussed the needs of disadvantaged population groups on government agendas and revealed the importance of meeting the peculiarities of these groups. Currently, the 'Brazil without Poverty Plan' and the 'National Plan for Food and Nutrition Security' fit within the scope of these strategies (Sousa et al., 2013). Therefore, the 'National Policy on Solid Waste', established by Law 12305/2010, focused on improvements in the conditions of people living in the vicinity of landfills and / or those performing activities of collection of recyclable materials. This policy seeks new alternatives for the proper disposal of solid waste and focuses on important environmental, social and economic actions (Brasil, 2010). However, the literature fails to deal with the food and nutrition status of people living in these conditions.

The social vulnerability of these families is related to structural poverty, aggravated by economic problems (Gomes & Pereira, 2005). Low-income populations tend to live in risky areas (next to garbage dumps and in places liable to floods and landslides) coupled to other environmental, sanitary and health problems (Alves, 2007). In such situations of poverty, people face social, economic, political and cultural deprivation that hinders choices and opportunities to live a dignified life (Pessanha, 2004). From the biological point of view, the children of families with such risks are the most vulnerable segment in food insecurity, or rather, the nutritional consequences are more immediate and severe. Further, when a child has nutritional disorders due to food insecurity, it may be assumed that the adults of this family have been eating insufficiently for some time (Oliveira et al., 2009; Oliveira et al., 2010).

Current study evaluates the nutritional status of under-five-year-old children living in a locality intentionally studied because of its social vulnerability and association with personal and socioeconomic characteristics.

Material and methods

This is a cross-sectional study whose results are part of the 'Nutritional profile of children under five years living in a socially vulnerable area in Campina Grande, Paraíba State and the situation of food insecurity of their families'.

Location, population and study sample

Campina Grande is the second largest city in the state of Paraiba, Brazil, with an area of 594.18 km^2, and 385,213 inhabitants in 2010 (Instituto Brasileiro de Geografia e Estatística [IBEG], 2010c). Currently, the city's basic health-care service has 98 Basic Family Health Units (BFHU) distributed into six sanitary health districts (Instituto Brasileiro de Geografia e Estatística [IBGE], 2010d).

The study included all families registered in BFHU (I and II) of the district Mutirão with some former collectors of recyclable materials from the landfill of Campina Grande, Paraíba State, and with children under five years in the household. The landfill lies in the southwestern region, on the BR 230 road, some 8 km from downtown, occupying an area of 35 hectares (Pereira & Melo, 2008). The landfill was deactivated in January 2012, following Law 12305/2010 on the National Policy on Solid Waste (Brasil, 2010).

The BFHU I and II of the district Mutirão were selected for current survey since all the families living near the deactivated garbage dump are included in the units. All 668 families enrolled in the above-mentioned health units were included to obtain the sample. Family health charts and clinical records were retrieved to see if the family included any member collector of recyclable materials (n = 98) and also 84 families with children under five years. Community health workers were asked whether the collectors of recyclable materials belonging to these 84 families had performed activities in the Campina Grande landfill, with positive confirmation for all cases. Invitations were sent to all mothers of these households to attend a meeting at their BFHU at a specified date and time. The invitations indicated the importance of participating in the research due to its goals. In the case of mothers who did not attend the BFHU meeting, home visits were programmed.

Families with mothers under 18 years (n = 5) and children with serious congenital malformations (n = 2) were excluded. Since one mother refused to participate in the study, 76 families were investigated. Figure 1 shows the scheme to obtain the study sample.

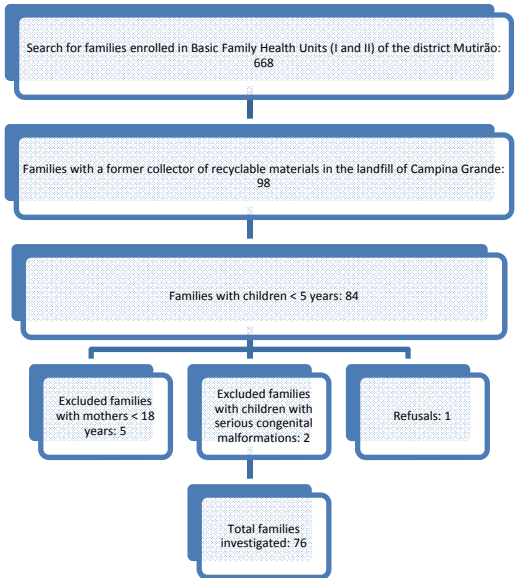

Figure 1. Scheme for obtaining the study sample of research 'Nutritional status of children under five years living in a socially vulnerable area in Campina Grande, Paraíba State, Brazil'.

Procedures for information collection and data analysis

Four interviewers and three evaluators were trained. They received instructions with information on research objectives, methodology in fieldwork and data-collecting instrument. A pilot study was conducted in the Maria Emilia Cordeiro Pedrosa municipal day-care center of Campina Grande, where 12 mothers were interviewed and the necessary adjustments to the data-collecting instrument were performed.

A questionnaire was applied to mothers for the collection of data on the characteristics of the children and the socioeconomic conditions of the families. Data collection was carried out between June and August 2012.

The study variables were:

1. Dependent variables: weight / age (W / A); height / age (H / A); weight / height (W / H) of children.

2. Independent variables:

- Characteristics of children: age (> = 25 months and < 60 months); sex (male, female); birth weight (normal, low weight); diarrhea during the previous 15 days (yes or no); phlegm / cough during the previous 15 days (yes or no); protozoa during the previous 15 days (yes or no). Variables related to the health status of children were reported by mothers and related to 15 days prior to the interview. The child's age was calculated by dates of interview and birth. Birth weight and birth date were obtained from the Child Health Handbook. Cutoff value of 2.500 g was used to define low birth weight.

- Socioeconomic characteristics of families: mother's education (complete basic schooling; incomplete basic schooling; illiterate); mother's marital status (with partner, without partner); home waste disposal (collected, buried / burned / open); home treatment of drinking water (yes, no); per capita household income in minimum wages (> = 0.25, < 0.25).

Children´s weight, length (under 24 months) and height (over 24 months) were measured following procedures recommended by the World Health Organization (1995). Weight was measured using Tanita UM-080 ® digital scale, with an accuracy of 100 grams. The weight of children under 24 months was obtained by the difference between the weight of the mother with the child on her lap and the mother's weight. Length was measured with a portable wooden infant meter with amplitude of 150 cm and 0.1 cm subdivisions. Height was measured using WCS stadiometer with amplitude of 220 cm and 1 mm subdivisions, in the vertical position. All measurements were performed twice and the average value used.

The nutritional status of children was expressed in Z-score of W / A, H / A and W / H indexes according to the reference standard of the Multicentre Growth Study (De Onis, Onyango, Van den Broeck, Chumlea, & Martorell, 2004). Calculations were performed with the WHO Anthro 2005 software beta version. Nutritional diagnostic categories included weight for age deficit (W / A < -2 Z-score), weight deficit (W / H < -2 Z-score), stunting (H / A < -2 Z-score), overweight for age W / H > +2 Z-score) and overweight (W / H > +2 Z-score) (Figueroa Pedraza, Rocha & Sousa, 2013).

Z-score of W / A, H / A and W / H indexes were analyzed as continuous dependent variables. Student´s *t* test and ANOVA test compared differences between means in the bivariate analyses. Correlation matrix did not identify multi-co-linearity, as the Pearson correlation coefficients were lower in absolute value than 0.7. All variables with p < 0.20 in the bivariate analysis were selected for initial inclusion in the regression analysis. Multiple linear regression was performed using the hierarchical model of variables input in order to evaluate the influence of explanatory variables on W / A, H / A and W / H indexes. Explanatory variables were dichotomous, except for mother's education, and were treated as an indicator variable (dummy). A process of modeling in two blocks of variables was adopted, using the "enter" sequence method, so that initially the nutritional status of children under five years was set by the characteristics of children and in the second block by the socioeconomic characteristics of families. p values < 0.05 were significant. Statistical analyses were performed with R software v 2 10.0.

Current study complies with Resolution 196/1996 of the National Health Council and the research project was approved by the Research Ethics Committee of the State University of Paraíba (Protocol 0035.0.133.000-12). The relevance and objectives of the study were explained to participants who signed the Informed Consent Form, a necessary condition for their participation. It was guaranteed to all those involved the freedom to not participate in the survey or to interrupt participation, privacy of images and confidentiality of information.

Results

The assessment of the nutritional status of children by W / A, and W / H indexes revealed prevalence of low weight for age and weight deficit of 2.6 and 6.6%, respectively, while overweight

frequency was 1.3%. According to the W / A index, the prevalence of stunting was 19.7% (Figure 2).

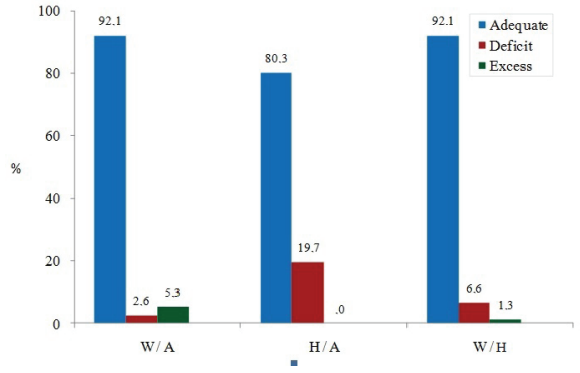

Figure 2. Nutritional status of children under five years living in a socially vulnerable area according to weight / age (W / A), height / age (H / A) and weight / height (W / H) indexes, Campina Grande, Paraíba State, Brazil, 2012.

In the bivariate analysis, the determinants of W / A, H / A and W / H indexes (Table 1), the characteristics of children associated with the low average Z-score of W / A index, were low birth weight and presence of diarrhea during the previous 15 days. For H / A index, low average Z-score was observed in children whose mothers reported diarrhea and protozoa in the children during the previous 15 days. Protozoa during the previous 15 days determined low average Z-scores of W / H index. No statistical significance in all situations was found when socioeconomic characteristics were taken into account.

Current study showed that adjusted W / A, H / A and W / H indexes were negatively influenced for children with low birth weight, with diarrhea in the previous 15 days prior to the interview and with protozoa during the same period. Phlegm / cough in children over the previous 15 days explained only W / A index. Among the socioeconomic characteristics, the H / A index for children of unmarried mothers also represented one of the determinants of the children surveyed (Table 2).

Table 1. Weight / age, height / age and weight / height indexes expressed as Z-score of children under five living in a socially vulnerable area, according to socioeconomic characteristics of children and families. Campina Grande, Paraíba State, Brazil, 2012.

Variables	N	%	Weight / Age				Height / Age				Weight / Height			
			Mean	SD	CI 95%	p	Mean	SD	CI 95%	p	Mean	SD	CI 95%	p
Characteristics of Children														
Age						0.485				0.676				0.532
>= 25 months and < 60 months	47	61.8	-0.13	1.29	-0.51 to 0.25		-0.93	1.15	-1.26 to -0.59		0.57	1.33	0.18 to 0.96	
< 25 months	29	38.2	0.08	1.27	-0.40 to 0.57		-0.80	1.49	-1.36 to -0.23		0.77	1.32	0.27 to 1.27	
Sex						0.188				0.072				0.844
Male	47	61.8	-0.20	1.32	-0.59 to 0.18		-1.08	1.19	-1.43 to -0.74		0.62	1.45	0.20 to 1.05	
Female	29	38.2	0.20	1.20	-0.26 to 0.65		-0.54	1.37	-1.06 to -0.02		0.69	1.08	0.27 to 1.10	
Birth weight						0.037				0.138				0.073
Normal (>= 2.500 g)	67	90.5	0.07	1.29	-0.25 to 0.38		-0.78	1.29	-1.09 to -0.47		0.75	1.36	0.42 to 1.08	
Low weight	7	9.5	-0.99	0.87	-1.80 to -0.19		-1.54	1.11	-2.57 to -0.51		-0.20	0.58	-0.74 to 0.33	
Diarrhea in the previous 15 days						0.026				0.021				0.126
No	58	76.3	0.16	1.36	-0.20 to 0.53		-0.65	1.30	-0.99 to -0.30		0.79	1.45	0.41 to 1.18	
Yes	18	23.7	-0.63	0.80	-1.03 to -0.23		-1.48	1.05	-2.00 to -0.96		0.23	0.77	-0.15 to 0.62	
Phlegm / cough in the previous 15 days						0.087				0.317				0.286
No	13	17.1	0.50	1.93	-0.67 to 1.67		-0.55	1.65	-1.55 to 0.45		1.21	2.17	-0.09 to 2.52	
Yes	63	82.9	-0.15	1.10	-0.43 to 0.14		-0.92	1.20	-1.22 to -0.61		0.54	1.07	0.26 to 0.81	
Worms in the previous 15 days						0.075				0.037				0.004
No	64	84.2	0.09	1.33	-0.25 to 0.43		-0.71	1.30	-1.04 to -0.38		1.91	2.32	-0.04 to 3.85	
Yes	12	15.8	-0.65	0.83	-1.18 to -0.13		-1.58	0.95	-2.18 to -0.98		0.48	1.08	022 to 0.74	
Socioeconomic Characteristics of Families														
Mother's education						0.165				0.389				0.337
Complete basic schooling	8	10.5	0.63	1.29	-0.45 to 1.70		-0.30	1.31	-1.40 to 0.80		1.07	1.19	0.07 to 2.06	
Incomplete basic school	62	81.6	-0.18	1.06	-0.45 to 0.09		-0.96	1.23	-1.27 to -0.65		0.54	1.09	0.26 to 0.82	
Illiterate	6	7.9	0.40	2.74	-2.48 to 3.27		-0.80	1.70	-2.57 to 0.98		1.18	2.96	-1.93 to 4.29	
Mother's marital status						0.494				0.088				0.629
With partner	59	77.6	0.00	1.25	-0.32 to 0.33		-0.71	1.15	-1.01 to -0.41		0.61	1.28	0.27 to 0.94	
Without partner	17	22.4	-0.24	1.41	-0.97 to 0.49		-1.44	1.57	-2.25 to -0.64		0.78	1.47	0.03 to 1.54	
Home garbage disposal						0.275				0.813				0.093
Collected	56	73.7	0.21	1.67	-0.59 to 1.02		-0.86	1.27	-1.20 to -0.52		1.04	1.79	0.17 to 1.90	
Buried / Burning / Open	20	26.3	-0.15	1.13	-0.45 to 0.16		-0.87	1.34	-1.52 to -0.23		0.50	1.10	0.20 to 0.79	
Home treatment of drinking water						0.392				0.733				0.335
Yes	68	89.5	0.61	2.25	-1.27 to 2.48		-0.84	1.29	-1.15 to -0.53		0.72	1.40	0.37 to 1.08	
No	8	10.5	-0.13	1.13	-0.41 to 0.14		-1.02	1.26	-2.08 to 0.03		0.31	0.83	-0.22 to 0.84	
Per capita family income						0.206				0.690				0.119
>= 0.25 Minimum Wages (BRL 622.00)	28	37.3	0.22	1.67	-0.42 to 0.87		-0.78	1.22	-1.26 to -0.31		0.98	1.66	0.34 to 1.62	
< 0.25 Minimum Wages	47	62.7	-0.22	0.98	-0.51 to 0.07		-0.91	1.32	-1.30 to -0.52		0.43	1.03	0.12 to 0.73	

Table 2. Hierarchical linear regression models of determinant factors of weight / age, height / age and weight / height of children under five living in a socially vulnerable area. Campina Grande, Paraíba State, Brazil, 2012.

Indexes / Variables	Model 1 β	Model 2 β	R^2 (%)
Weight / Age			32.2
Sex			
Female	0.464	0.444	
Child's birth weight			
Low birth weight (< 2.500 g)	-1.191*	-1.448*	
Diarrhea in the previous 15 days			
Yes	-0.548*	-0.575*	
Phlegm / cough in children in the previous 15 days			
Yes	-0.371*	-0.318*	
Worms in children in the previous 15 days			
Yes	-0.522*	-0.547*	
Mother's education			
Incomplete basic schooling		-0.160	
Illiterate		0.146	
Height / Age			25.8
Sex			
Male	0.567	0.443	
Birth weight			
Low weight (< 2.500 g)	-0.719*	-0.783*	
Diarrhea in the previous 15 days			
Yes	-0.658*	-0.776*	
Worms in the previous 15 days			
Yes	-0.420*	-0.338*	
Mother's marital status			
Without partner		-0.799*	
Weight / Height			38.1
Birth weight			
Low weight (< 2.500 g)	-0.967*	-0.929*	
Diarrhea in the previous 15 days			
Yes	-0.314	-0.379*	
Worms in the previous 15 days			
Yes	-1.323*	-1.330*	
Home garbage disposal			
Buried / Burning / Open		-0.348	
Per capita family income			
< 0.25 Minimum Wages (BRL 622.00)		-0.305*	

*$p < 0.05$; β: Regression coefficient; R^2: determination coefficient.

Discussion

In current study, the prevalence of chronic and acute malnutrition, measured by height and weight deficiencies, respectively, does not show the values as normal, according to the international standard of reference (Figueroa Pedraza et al., 2013). The prevalence of a 19.7% stunting in children in current study is much higher than that found in Northeastern Brazil for children younger than five years, according to the 2006 PNDS (Brasil, 2009) and 2008-2009 POF (IGBE, 2010b), with a 5.9% prevalence. In marginalized populations, such as indigenous and marooned (quilombola) communities, the prevalence of stunting in nationwide surveys reached 25.7% (Horta et al., 2013) and 15.0% (Taddei, Colugnati, & Cobayashi, 2008) respectively, closer to the results in current study. Several studies on children from geographic contexts with predominant precarious living conditions also demonstrated greater prevalence of stunting when compared to rates in national surveys (PNDS and POF), as in São João do Tigre, in the semiarid region of the state of Paraiba (Oliveira et al., 2009) and Gameleira, in the Zona da Mata, state of Pernambuco (Oliveira et al., 2010), as well as among beneficiaries of the Family Allowance Program (Brasil, 2014), with rates for children under five years reaching 14.6, 16.5 and 12.2%, respectively. Similar results were also reported for children under two years in the rural settlements and camps in the Midwestern region in the state of Paraná (Lang, Almeida, & Taddei, 2011) and riverside communities in the state of Pará (Silva & Moura, 2010) as well as children under six years from the slum areas of Maceió, Alagoas (Silveira, Alves, Ferreira, Sawaya, & Florêncio, 2010) respectively with 8.0, 13.4 and 8.6%. It is relevant to note that data from under-two-year-old children may be directly compared to those of this study, since the population studied showed no anthropometric difference with regard to the child's age group.

In the case of prevalence of weight deficit (6.6%), there is a significant prevalence of weight loss among the children studied, unlike national data (Brasil, 2009), in population-based surveys focusing on indigenous (Horta et al., 2013) and maroon populations (Taddei et al., 2008) and other studies (Figueroa Pedraza et al., 2013; Oliveira et al., 2009; Oliveira et al., 2010) which point to the virtual control of acute forms of energy deficiency. However, prevalence in current study is consistent with other studies at different locations in

Brazil (Chagas et al., 2013; Saavedra & Câmara, 2010; Silva & Moura, 2010; Silveira et al., 2010; Souza, Benício, Castro, Muniz, & Cardoso, 2012). The above indicated that there may be populations where acute malnutrition is significant from the point of view of public health. Contrastingly, global malnutrition remains at epidemiological relevance levels, according to results of studies in different contexts (Brasil, 2009; Horta et al., 2013; Lang et al., 2011; Oliveira et al., 2009; Oliveira et al., 2010; Silva & Moura, 2010; Taddei et al., 2008), and overweight becomes evident as the product of the nutritional transition process in children of different geographic and / or vulnerability situations (Brasil, 2014; Figueroa Pedraza et al., 2013; Oliveira et al., 2009; Oliveira et al., 2010; Ramalho et al., 2013; Taddei et al., 2008).

Results in current paper show inequalities consistent with national surveys, highlighting problems in the linear and weight growth of children in the country, especially among marginalized populations. Thus, there is a strong influence of living conditions according to the model used to determine the nutritional status. In the case of weight for age deficit, it is suggested that there are still major challenges, highlighting the current critical moment, since a commitment to achieving a set of eight Millennium Development Goals by the year 2015 was established, including eradicating hunger and extreme poverty, which has the W / A index as target indicator. This scenario, associated with the increase in overweight rates, reflects the complexity of the nutritional status of Brazilian children in the modern world.

Due to its multi-causal nature, the nutritional status of children involves several factors (Rissin, Figueiroa, Benício, & Batista Filho, 2011). Consequently, basic determinants related to purchasing power determine the access to essential services (underlying determinants) with consequences on food consumption and health status that are immediate determinants of the nutritional status (Bellamy, 1997). The results of this study showed the preponderance of immediate determinants to explain the nutritional status of the children under study. The lack of association of socioeconomic factors with the nutritional status of children may be related to the general poor conditions of the population group investigated.

In spite of evidence in determining the nutritional status of children by environmental factors, affecting malnutrition and overweight rates (Araújo et al., 2010; Figueiroa, Alves, Lira, & Batista Filho, 2012; Lima et al., 2010; Monteiro et al., 2009; Rissin et al., 2011; Sichieri, Barbosa & Moura, 2010; Felisbino-Mendes, Villamor, & Velasquez-Melendez,, 2014), individual factors may demonstrate strong association, especially when adjusted for environmental conditions and lifestyles with these outcomes (Araújo et al., 2010; Felisbino-Mendes et al., 2014; Sichieri et al., 2010). Overweight and stunting are nutritional extremes that may coexist in families in developing countries. Both maternal weight and stature may influence the linear growth potential and weight gain of the children. These circumstances have been explained by the sharing of genetic, socioeconomic and environmental characteristics (Addo et al., 2013; Araújo et al., 2010; Felisbino-Mendes et al., 2014; Figueroa Pedraza et al., 2013; Sichieri et al., 2010; Symonds et al., 2013).

Current analysis revealed a strong association between birth weight and the anthropometric nutritional status of children, with similar results in previous studies, such as studies based on municipal or state population data (Jesus, Castelão, Vieira, Gomes, & Vieira, 2014; Figueiroa et al., 2012; Rissin et al., 2011) and in populations marked by social inequity (Horta et al., 2013; Lang et al., 2011; Silveira et al., 2010). This association, verified for several anthropometric indexes (Figueiroa et al., 2012; Figueroa Pedraza et al., 2013; Horta et al., 2013; Jesus et al., 2014; Lang et al., 2011; Rissin et al., 2011; Silveira et al., 2010), shows two perspectives: i) children with low birth weight, regardless of compensatory growth in the first three months of life, continue to have weigh rates below those of children with adequate birth weight, contributing to increased vulnerability to infectious processes and other negative postnatal factors, which are added to the prenatal growth programming (Motta, Silva, Araújo, Lira, & Lima, 2005); ii) low birth weight may result in adaptation mechanisms such as catch-up growth and hormonal disorders that might predispose the child to the development of overweight / obesity (Chrestani, Santos, Horta, Dumith, & Dode, 2013; Motta el al., 2005; Rossi & Vasconcelos, 2010).

In this study, the W / A, H / A and W / H indexes negatively impacted cases of children with tapeworms. This influence may be explained by the fact that adequate nutritional status depends not only on food intake but also on its efficient biological utilization, which may be compromised in cases of infestation with intestinal parasites (Biscegli et al., 2009).

The frequency of diarrhea (23.7%) and phlegm / cough (82.9%) in children in this study, which is higher than national rates (13.2 and 26.3%) (Brasil, 2009), suggests that the precarious living conditions to which children are submitted in this area are

responsible for these morbidities. High prevalence reflects and implies associations with the anthropometric status, for example, the influence of diarrhea on the increased likelihood of stunting (Checkley et al., 2008).

The scenario described indicates that the socioeconomic vulnerability of children is associated with health damages and development of infections which condition anthropometric deviations of a multi-causal nature. Consequently, it is necessary to point the limitations of this study featuring the lack of assessment of food consumption as a decisive factor in the establishment of the nutritional status.

In the population under analysis, characterized by social vulnerability, the deficits in height and weight were the major anthropometric deviations, especially stunting. This profile is associated to health and socioeconomic characteristics. It is imperative to improve public actions for a better life quality of this population so that the appalling conditions in which they barely survive could be reduced. This reality raises the need for in-depth robust studies, since cross-sectional surveys, such as current one, fail to establish causality. The development of longitudinal studies is essential to reveal the losses that extreme states of social economic and environmental marginalization may have on the nutritional status of children. Despite its limitations, current study shows that among children living near the dumping ground, stunting was higher than that in other Brazilian children.

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