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Correspondence between maternal perception and students' nutritional status

Luana da Silva Baptista Arpini[1]
André Fiorin Arpini[2]
Geovane Carlos Barbosa[3]
Gláucia Figueiredo Justo[4]
Luciane Bresciani Salaroli[5]
Maria del Carmen Bisi Molina[5]

[1] Secretaria de Saúde do Estado do Espírito Santo, Hospital Estadual Infantil Nossa Senhora da Glória. Cariacica-ES, Brasil.

[2] Secretaria Municipal de Saúde de Cariacica, Programa de Saúde Mental. Cariacica-ES, Brasil.

[3] Faculdade do Centro Leste, Departamento de Engenharia Biomédica. Serra-ES, Brasil.

[4] Universidade Federal do Rio de Janeiro, Instituto de Estudos em Saúde Coletiva. Rio de Janeiro-RJ, Brasil.

[5] Universidade Federal do Espírito Santo, Departamento de Educação Integrada em Saúde, Curso de Nutrição. Vitória-ES, Brasil.

Correspondence
Luana da Silva Baptista Arpini
E-mail: luanaarpini@hotmail.com

Abstract

Introduction: Maternal perception (MP) of the nutritional status of the child (NS), when mismatched with the diagnosis, can lead to nutritional disorders. *Objective*: To evaluate the correlation between maternal perception and the nutritional status of schoolchildren as well as the associated factors. *Methods*: Sample consisted of 518 schoolchildren aged 7-10 years. Anthropometric data were collected for diagnosing nutritional status using the body mass index (BMI) and socioeconomic data, and maternal perception by interviewing the mothers. Prevalence-adjusted Kappa (k) to verify the correspondence between MP and NS, chi-square and Fisher's exact tests to determine differences in proportions, and multinomial logistic regression to adjust for associated variables, were applied. *Results*: Highest and lowest correspondences between the MP and NS were found for thinness and obesity. Male schoolchildren and those whose mothers are concerned with weight are more likely to be perceived as "underweight". *Conclusion*: Substantial agreement between nutritional status and maternal perception was found.

Key words: Perception. Nutritional Status. School Health. Child.

Introduction

Perception is the interpretation of what an individual observes by means of the senses and cognitive process[1] and, therefore, may not correspond to reality. Maternal perception of their child's body, specifically, when disagreeing with the nutritional status diagnosis, can lead to nutritional disorders,[2,3] influence on the child eating practices[3,4] and hinder or jeopardize a nutritional treatment.[3,5,6]

In general, mothers overestimate the children's weight when they are thin and underestimate the weight of those who are overweight and obese.[3,5,7-11] Such distorted perception can be associated with various factors. Rietmeijer-Mentink et al.[10] when conducting a meta-analysis of the difference between the parents' perception and the child's actual weight, found that 63.4% of the parents of overweight children do not recognize their children as such, and this percentage rises to 86% when it comes to children aged 2-6 years.

Besides age, we also found indicators in other systematic reviews, such as gender, nutritional status, sociocultural patterns, education, mother's body mass index (BMI), father's BMI, marital status, and ethnicity, as the most cited predictors of maternal perception in the world literature.[3,12]

Despite the importance of this subject, in Brazil there are few studies aiming to evaluate the agreement between maternal perception and the nutritional status of their child, mainly in rural areas. In the urban area of the state of Espírito Santo, it was observed a low correlation between the anthropometric classification and maternal perception, especially of obese children, being gender (male) and the child' skin color (not white) the related factors.[9] However, this association is still unknown in mother-child dyads in the rural area of the state. Thus, the aim of this study is to investigate the correspondence between the mother's perception and the nutritional status of schoolchildren in a rural locality, as well as other related factors.

Methods

Cross-sectional study, conducted in 2013, based on the analysis of data obtained by the "Saúdes – Santa Maria de Jetibá" project (Health – Santa Maria de Jetibá) carried out in 2009. The municipality of Santa Maria de Jetibá (SMJ) is located in the rural area of the state of Espírito Santo, Brazil, and the main activity is the production of fresh farm produces (legumes, fruits and poultry). It was colonized by "Pomeranians", who still try to maintain alive the culture and tradition of their origins, such as, for example, food and dialect.

Participants of the study were 7-10 year old children, enrolled in and attending municipal, state or cooperate schools. They were selected by two-stage stratified random sampling, taking into consideration the number of students enrolled in schools per region (urban and rural perimeters) and the school size (small, up to 50 students; medium, from 51 to 200 children; large: more than 200 students), being proportional to quotas and schematized by the number of enrollment in the school 2008. [13] Children whose data of weight, stature, and maternal perception were not complete were not considered eligible to participate in the study.

Prior to data collection, a pilot study was conducted with 40 students of the same age, with the purpose of testing the instruments, data collection time, logistics and the parents' agreement to the children's participation in the study. All professionals (undergraduates of the courses of Nutrition and Physical Education) who collected the data received theoretical and practical training to ensure standardized research protocol in data collection. Following this initial study, the necessary adjustments were made to start the fieldwork in the municipality.

A structured questionnaire was administered to mother-child dyads. Mother's perception of the nutritional status of the child was identified by the responses to the question "How do you think your child is?", based on the following alternatives: "underweight", "normal weight", "overweight". These alternatives corresponded, respectively, to the nutritional diagnosis of thinness, eutrophy (or normal weight) and overweight/obesity. Mother's concern with the child weight was investigated by the following question: "Are you worried or have you already been worried with the weight of your child?" and responses were yes/no. The variables associated with the maternal perception included gender, age (at the time of data collection), race/skin color, birth weight, location of the school, nutritional status of mother and child, mother's educational level and age, socioeconomic class and mother's concern with the child's weight.

Anthropometry of the children was performed at school and followed the standard procedures described by the World Health Organization (WHO),[14] and the socioeconomic data, health condition, physical activity and dietary habits were obtained by interviews with the mothers. The children were weighed barefoot and with the fewest clothes possible, positioned vertically at the center of the platform of digital Tanita® scale, Family BWF model (Tanita, Illinois, USA), 100-gram precision, and the weight was expressed in kilograms. Stature was measured in centimeters, with precision of 1 millimeter, using a portable stadiometer brand Seca®, model 206 (Seca, Hamburg, BRD). The children's measures were taken while lying on a flat surface, barefoot, buttocks and heels against the wall and looking directly in front of them. The nutritional status was determined by the BMI and classified according to the cutoff points proposed by Onis et al. in 2007[15], as follows: "thinness" $\leq$ -2 DP; "normal weight" -2 < DP $\leq$ +1; "overweight" > + 1DP; "obesity" > + 2DP.

The mothers' BMI was estimated using the weight and height measures reported by the mother and classified as per WHO.[16] The mother's educational level corresponded to the last school year that she had attended and was categorized into ≤ 3, 4-10, ≥11 years. Race/color was classified by two independent interviewers and dichotomized into "white" and "black/brown"; location of the school, according to the region (rural, urban); and the socioeconomic class was determined by the scoring system proposed by the Associação Brasileira de Empresas de Pesquisa (ABEP) (Brazilian Association of Survey Enterprises)[17] and re-classified into A+B, C and D+E.

Statistical analyses were carried out using the statistical software IBM® SPSS for Windows, version 20.0 and WINPEPI (PEPI-for-Windows). Differences between proportions were determined by the chi-square test and Fisher's exact test. To evaluate the correspondence between the mother's perception and their child's nutritional status, we used the Kappa test adjusted by prevalence (k), considering the classification proposed by Landis & Koch,[18] as follows: almost perfect agreement (0.80-1.00), substantial agreement (0.60-0.79), moderate agreement (0.41-0.59), reasonable agreement (0.21-0.40) and poor agreement (≤0.20). To estimate the factors associated with the mother's perception of the child nutritional status, multinomial logistic regression was performed considering in the model the variables that presented a 20% statistical significance in the univariate analysis. The variables that were not statistically significant were excluded from the model.

Regarding ethical considerations, the provisions contained in the Resolution no. 196/96 of the National Health Council were observed. The study was conducted after being approved by the Research Ethics Committee of the Federal University of Espírito Santo (UFES), process no. 60/09 of May 2009, and the parents signed the Free Informed Consent Form. The questionnaires could be responded in the Pomeranian language, respecting and not causing any embarrassment to the respondent at the time of data collection, once the interviewers lived in the region, knew the dialect and helped in the translation of the interview when requested by the participant.

Results

Population of the study was comprised of 518 students, 52% male, the majority white (81.8%), with normal weight (84%), socioeconomic class C (57.4%), whose mothers had 4-10 years of formal education (81.6%), as shown in Table 1.

Table 1. Sample distribution and difference of proportions between maternal perception of child nutritional status and independent variables (n=518). Santa Maria de Jetibá-ES, 2009.

Variables	Total		Maternal perception of their child's nutritional status						p-value *
			Underweight		Normal weight		Overweight		
	N	%	n	%	N	%	n	%	
Sex									
Male	269	51.9	71	59.2	177	49.9	21	48.8	0.191*
Female	249	48.1	49	40.8	178	50.1	22	51.2	
Age									
7 years	153	29.5	41	34.2	103	29.0	9	20.9	0.500
8 years	139	26.8	30	25.0	100	28.2	9	20.9	
9 years	125	24.1	27	22.5	85	23.9	13	30.2	
10 years	101	19.5	22	18.3	67	18.9	12	27.9	
Race/Color									
White	374	81.8	84	75.0	261	84.7	29	78.4	0.060*
Black/brown	83	18.2	28	25.0	47	15.3	8	21.6	
Nutritional status									
Underweight	18	3.5	14	11.7	4	1.1	0	0.0	<0.001**
Normal	435	84.0	104	86.7	322	90.7	9	20.9	
Overweight	39	7.5	2	1.7	24	6.8	13	30.2	
Obesity	26	5.0	0	0.0	5	1.4	21	48.8	
School location									
Rural area	343	66.2	74	61.7	246	69.3	23	53.5	0.059*
Urban area	175	33.8	46	38.3	109	30.7	20	46.5	
Birth weight									
Low weight	32	6.5	8	7.1	24	7.1	0	0.0	0.117*
Normal weight	433	88.4	102	91.1	292	86.9	39	92.9	
Overweight	25	5.1	2	1.8	20	6.0	3	7.1	

Variables	Total		Maternal perception of their child's nutritional status						p-value ‡
			Underweight		Normal weight		Overweight		
	N	%	n	%	N	%	n	%	
Mother's age									
≤30 years	121	23.6	37	31.4	76	21.6	8	18.6	0.079*
>30 years	392	76.4	81	68.6	276	78.4	35	81.4	
Mother's education									
≤3 years	9	1.8	3	2.5	5	1.4	1	2.4	
4 – 10 years	416	81.6	99	83.9	289	82.3	28	68.3	0.127*
≥ 11 years	85	16.7	16	13.6	57	16.2	12	29.3	
Mother's BMI									
Underweight	10	2.8	5	6.0	5	2.1	0	0.0	
Normal	182	51.1	48	57.1	122	50.6	12	38.7	0.071*
Overweight	107	30.1	17	20.2	75	31.1	15	48.4	
Obesity	57	16.0	14	16.7	39	16.2	4	12.9	
Concerned about their child's weight									
Yes	271	52.8	102	85.0	137	38.6	32	74.4	<0.001**
No	242	47.2	18	15.0	213	60.0	11	25.6	
Socioeconomic class									
A +B	20	4.3	4	3.6	13	4.1	3	7.9	
C	267	57.4	65	58.6	181	57.3	21	55.3	0.815
D+E	178	38.3	42	37.8	122	38.6	14	36.8	

‡Fisher's exact test, *p *value* ≤0.10, **p *value* < 0.05

Regarding the maternal perception of their child's nutritional status, 90.7% of the children perceived as being with "right weight" were considered as "eutrophic, or with normal weight", 1.1% as thin, and 8.2% as being overweight. Of the children perceived by the mothers as "underweight", 88.4% had their nutritional status underestimated, i.e., 86.7% if the children had normal weight. Most of the children perceived as "overweight" (48.8%), were already obese, as indicated in Table 1.

When assessing the correspondence between maternal perception and their child's nutritional status, it could be seen higher and lower agreements for thinness (77.8%) and obesity (3.8%), according to Table 2.

Table 2. Agreement between the maternal perception and the nutritional status of schoolchildren (n=518). Santa Maria de Jetibá-ES, 2009.

Child's nutritional status	Maternal perception of their child's nutritional status								Total	
	Underweight		Normal weight		Overweight		Very overweight			
	n	%	n	%	N	%	n	%	n	%
Thinness	14	77.8	4	22.2	0	0.0	0	0.0	18	3.5
Normal	104	23.9	322	74.0	9	2.1	0	0.0	435	84.0
Overweight	2	5.1	24	61.5	11	28.2	2	5.1	39	7.5
Obesity	0	0.0	5	19.2	20	76.9	1	3.8	26	5.0
Total	120	23.2	355	68.5	40	7.7	3	0.6		

k = 0.77

In general, 67% of the mothers perceived their child's nutritional status corresponding to the classified BMI, while 30% of them underestimated and 3% overestimated (data not shown). Of the overweight children, nearly half of the mothers (47.7%) did not perceive that their children were overweight or very overweight, and 44.6% of the overweight children were considered eutrophic.

The prevalence-adjusted Kappa test resulted in a considerable value[18] of total agreement (k = 0.77), as can be seen in Table 2. Similar agreement was observed both for female (k = 0.78) and male (k= 0.72), although slightly lower for the boys. (Table 3).

Table 3. Agreement between maternal perception and the nutritional status of schoolchildren, by sex (n=518). Santa Maria de Jetibá-ES, 2009.

Nutritional status	Maternal perception															
	Male¥								Female§							
	Underweight n (%)		Normal weight n (%)		Overweight n (%)		Very overweight n (%)		Underweight n (%)		Normal weight n (%)		Overweight n (%)		Very overweight n (%)	
Thinness	7	70.0	3	30.0	0	0.0	0	0.0	7	87.5	1	12.5	0	0.0	0	0.0
Normal	63	27.4	163	70.9	4	1.7	0	0.0	41	20.0	159	77.6	5	2.4	0	0.0
Overweight	1	5.9	10	58.8	6	35.3	0	0.0	1	4.5	14	63.6	5	22.7	2	9.1
Obesity	0	0.0	1	8.3	11	91.7	0	0.0	0	0.0	4	28.6	9	64.3	1	7.1

§k = 0.78

¥k= 0.72.

The mothers' perception of nutritional disorders of their children, of both sexes, showed a higher agreement in case of thinness (70% for boys and 87.5% for girls). Mothers of boys did not perceive obesity in their children, even though they recognized that their sons were "overweight" (Table 3).

Male children (59.2%) with normal weight (86.7%) and those whose mothers had normal weight (57.1%) were perceived as "underweight", while female (51.2%), obese children (48.8%), and those whose mothers were overweight (48.4%) were more perceived as "overweight" (Table 1). Both the perception of underweight or overweight were more frequent for white children (75.0% and 78.4%), students from the rural area (61.7% and 53.5%), having normal birth weight (91.1% and 92.9%), by mothers aged over 30 years (68.6% and 81.4%), having intermediate educational level (83.9% and 68.3%) and by those who expressed concern about their children's weight (85.0% and 74.4%).

Table 4 shows the variables that were included in the final analysis ($p<0.20$) and remained significantly ($p<0.05$) associated with maternal perception after adjustment in the logistic regression model.

Table 4. Factors associated with maternal perception of child nutritional status (n=518): adjusted odds ratio (OR) with respective confidence interval (95% CI). Santa Maria de Jetibá-ES, 2009.

Variable	Maternal perception of their child's weight			
	Underweight		Overweight	
	OR (95% CI)	p-value	OR (95% CI)	p-value
Sex				
Male	1.653 (1.046 – 2.614)	0.031	1.217 (0.576 – 1.217)	0.606
Female	1.000		1.000	
Mother's concern				
Yes	9.181 (5.278 – 15.968)	<0.001	2.072 (0.893 – 4.810)	0.090
No	1.000		1.000	

*Reference category: maternal perception of right weight.

Male children (OR=1.653; 95% CI = 1.046 – 2.614; p=0.031) and those whose mothers were worried about their weight OR=9.181; 95% CI = 5.278 – 15.968; p<0.001) were more likely perceived as "underweight" (Table 4).

Discussion

The results of this study corroborate others that showed that mothers usually do not perceive that their children have a nutritional disorder, particularly in cases of overweight.[1-3,5,9,19-21] In a survey conducted with Chilean children, normal mothers weight was highly associated with the prevention of child overweight, reducing by 20 times the odds of the child being overweight or obese.[2] In another study carried out with German children, the percentage of mothers reporting need for intervention was 13 times greater than for those who identified overweight in the 75th percentile, even though the majority of the mothers have indicated that intervention should be performed in the >90th percentile and 19% having said that up to the >97th percentile (serious obesity) intervention is not needed.[6]

Parents of overweight or obese children often do not know that their children have a weight problem [8] and are more likely to recognize overweight when their children are already obese than when they are overweight.[19,22] This shows a common inability to distinguish normal weight from inadequate weight due to the increased prevalence of obesity. When overweight is common, perception of weight may become distorted, that is, overweight is then perceived as "normal".[19,22-25] The idea that chubby babies have good health and are better fed by parents may be another predictor of such distorted perception.[5]

In addition, mothers of boys did not perceive obesity in their sons and are more likely to perceive them as "underweight" than mothers of girls, as found in study conducted in an urban area in the same state[9] and in Italian provinces.[19] Mothers usually perceive low weight in their sons and overweight in their daughters and underestimate more the boys' weight.[8] This may be related to sociocultural and behavioral influences, added to different aesthetic criteria.[26] Maternal perception of their daughters' ideal body is related to beauty ideals, which correspond to a lean, beautiful body, while for boys they prefer a bulkier body, which, in their conceptions, is related to strength and health.[27]

It should be noted that either thinness or overweight are conditions of concern and, therefore, parents should have a perception that corresponds to their children's actual nutritional status in order to perform earlier interventions when necessary. However, parents are usually reluctant in recognizing potential weight problems in their children, in both extremes of the body weight range, and it seems that any weight is the "right weight" when children are healthy and happy.[22] On the other hand, there may be denial or omission in the mothers' reports on their child nutritional disorder.[27,28] Mothers feel guilty when their children have a nutritional disorder[28], once social pressures and their own judgements make them associate such condition with poor maternal care.[27,28]

The mother's distorted body image of her child is one of the aspects that can be related with the control of the child's diet.[3] Mothers who did not perceive that their children are overweight usually urge them to eat more,[11] which can lead them to overeat and, consequently, put on weight.[3,7] On the other hand, parents who express concern about their child's weight are more likely to limit their time in front of a screen (television, computer, videogame), encourage physical activity and improve eating habits.[29] Furthermore, mothers who are worried about their child's overweight are more likely to restrict the consumption of "unhealthy" foods.[11] Study by Lindsay et al.[27] also adds that mothers, especially from the rural area and indigenous women, are more worried about hunger and malnutrition, due to the association they usually make with health impairment, preferring that their children are "fattier".

According to Campbell et al.,[30] overweight children seem to be more nourished and perceived as "better cared of", causing less concern to their parents. This argument may explain the fact that, in the present study, mothers who reported being worried about the weight of their children are nine times more likely to perceive them as "underweight" and not "overweight"; and that 86.7% of the children perceived as "underweight" were in fact in normal weight and, therefore, their nutritional status was underestimated.

The school location (urban/rural) was not associated with the mother's perception, even though it is possible that schoolchildren from the more urbanized areas of Santa Maria de Jetibá had better socioeconomic and lifestyle conditions, when compared to those from the countryside.[13]

No significant association was found between the mother's perception of the child nutritional status and the mother's educational background and/or socioeconomic class after adjustment. However, some studies point to the fact that mothers with more education and/or income seem to be able to identify the nutritional status of their children more closely to the actual diagnosed condition than mothers with low education and low income,[3,7,9,19] emphasizing the influence of social determinants in child health. Accordingly, study conducted in Holland with the aim of assessing the ethnic variation in mothers' underestimation of the child weight, found that low education of the mothers increases four times the likelihood of the child to have their weight underestimated.[25]

Other studies show the mothers' BMI and age and the child' skin color[9] as predictors of maternal perception, but such variables were not associated with the mother's perception in this study. In the rural population of this study, race/color is not a socioeconomic class proxy variable due to the homogeneity of white individuals, quite different from the city population.[9]

The cross-sectional design of this study prevents us from making causal inferences, but such design allows obtaining previous information for planning health interventions and support longitudinal studies. The results are applicable to the studied population, most of them comprised of white, eutrophic, medium/low economic class individuals and Pomeranian descendants living in the rural area of the state of Espírito Santo. Therefore, these results cannot be generalized to other racial, ethnic or geographic groups, although they are compatible with the findings of other studies, including those found in similar investigations in urban, but ethnically diversified, country areas. This suggests that, as in the study conducted by Yao and Hillemeir,[21] the location where a schoolchild lives (city or countryside) is not a predictor of maternal perception of the child's nutritional status.

Another limitation is that maternal perception was assessed by oral description, a method considered subjective. However, another method widely used in the literature to assess maternal perception of the child's weight is the silhouette scale, but in this case, there is no agreement in the literature on what would be the most appropriate instrument.[10]

Conclusion

This study showed a substantial agreement between the nutritional status and maternal perception, being the male sex and maternal concern the associated factors. Maternal perception disagreeing with the nutritional status may neglect on-time interventions, particularly in overweight children.

Further studies are necessary to evaluate the predictors of maternal perception of their child's nutritional status as well as the influence of this factor in the way of life and child health in the most diverse ethnic, social and cultural contexts.

References

1. Lara-García B, Flores-Peña Y, Alatorre-Esquivel MA, Sosa-Briones R, Cerda-Flores RM. Evaluation of the maternal perception of childhood overweight-obesity and maternal recognition of health risk in a Mexican border city. Salud Pública de México 2011; 53(3):258-63.
2. Bracho MF, Ramos HE. Percepción materna del estado nutricional de sus hijos: ¿Es un factor de riesgo para presentar malnutrición por exceso? Revista chilena de pediatría. 2007; 78(1):20-7.
3. Arpini LSB, Queiroz DMF, Corrêa MM, Salaroli LB, Molina MCB. Relação entre a percepção materna do peso corporal do filho e as práticas alimentares infantis. Rev. Bras. Pesq. Saúde 2014; 16(3):140-153.
4. Holub SC, Dolan EA. Mothers' beliefs about infant size: associations with attitudes and infant feeding practices. Journal of Applied Developmental Psychology 2012; 33(3):158-64.
5. Boa-Sorte N, Neri LA, Leite MEQ, Brito SM, Meirelles AR, Luduvice FBS, et al. Maternal perceptions and self-perception of the nutritional status of children and adolescents from private schools. Jornal de Pediatria 2007; 83(4):349-56.
6. Warschburger P, Kröller K. Childhood overweight and obesity: maternal perceptions of the time for engaging in child weight management. BMC Public Health 2012; 12:295.
7. Lopes L, Santos R, Pereira B, Lopes V. Maternal perceptions of children's weight status. Child: Care, Health and Development 2013; 39(5):728-736.
8. Mamun AA, McDermott BM, O'Callaghan MJ, Najman JM, Williams GM. Predictors of maternal misclassifications of their offspring's weight status: a longitudinal study. Int J Obes (Lond). 2008; 32(1):48-54.
9. Molina MCB, Faria CP, Montero P, Cade NV. Correspondence between children's nutritional status and mothers' perceptions: a population-based study. Cad. Saúde Pública. 2009; 25(10):2285-90.
10. Rietmeijer-Mentink M, Paulis WD, van Middelkoop M, Bindels PJE, van der Wouden JC. Difference between parental perception and actual weight status of children: a systematic review. Maternal & Child Nutrition 2013; 9(1):3-22.

11. Webber L, Hill C, Cooke L, Carnell S, Wardle J. Associations between child weight and maternal feeding styles are mediated by maternal perceptions and concerns. Eur. J. Clin. Nutr. 2010; 64(3):259-65.

12. Chuproski P, Mello DF de. Mother's perception of their children's nutritional status. Rev. Nutrição. 2009; 22(6):929-36.

13. Justo GF, Callo GQ, Carletti L, Molina MCB. Nutritional extremes among school children in a rural Brazilian municipality. Rural Remote Health 2012; 12(4):2220.

14. World Health Organization. Physical status: the use and interpretation of anthropometry indicators of nutritional status [Internet]. Geneva: WHO; 1995. Report No. 854. [acesso em: 3 abr. 2013]. Disponível em: http://whqlibdoc.who.int/trs/WHO_TRS_854.pdf

15. Onis M, Onyango AW, Borghi E, Siyam A, Nishida C, Siekmann J. WHO | Development of a WHO growth reference for school-aged children and adolescents [Internet]. Geneva: WHO; 2007 [Acesso em 3 de abril de 2013]. Disponível em: http://www.who.int/bulletin/volumes/85/9/07-043497/en/

16. World Health Organization. The international classification of adult underweight, overweight and obesity according to BMI. Geneva: WHO; 2004.

17. Associação Brasileira de Empresas de Pesquisa. Critério de classificação econômica Brasil [Internet]. São Paulo: ABEP; 2010. [Acesso em 20 mar. 2013]. Disponível em: http://www.abep.org/criterio-brasil

18. Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics 1977; 33(1):159-74.

19. Binkin N, Spinelli A, Baglio G, Lamberti A. What is common becomes normal: The effect of obesity prevalence on maternal perception. Nutr. Metab. Cardiovasc. Dis. 2013; 23(5):410-416.

20. Hirschler V, Gonzalez C, Talgham S, Jadzinsky M. Do mothers of overweight Argentinean preschool children perceive them as such? Pediatr. Diabetes 2006; 7(4):201-204.

21. Yao N, Hillemeier MM. Weight status in Chinese children: maternal perceptions and child self-assessments. World Journal of Pediatrics 2012; 8(2):129-35.

22. Petricevic N, Puharic Z, Posavec M, Pavic Simetin I, Pejnovic Franelic I. Family history and parental recognition of overweight in Croatian children. Eur. J. Pediatr. 2012; 171(8):1209-14.

23. Chaparro MP, Langellier BA, Kim LP, Whaley SE. Predictors of accurate maternal perception of their preschool child's weight status among hispanic WIC participants. Obesity 2011; 19(10):2026-30.

24. Hager ER, Candelaria M, Latta LW, Hurley KM, Wang Y, Caulfield LE, et al. Maternal perceptions of toddler body size: accuracy and satisfaction differ by toddler weight status. Arch. Pediatr. Adolesc. Med. 2012; 166(5):417-22.

25. Hoog MLA, Stronks K, van Eijsden M, Gemke RJBJ, Vrijkotte TGM. Ethnic differences in maternal underestimation of offspring's weight: the ABCD study. Int. J. Obes. (Lond). 2012; 36(1):53-60.

26. Gualdi-Russo E, Manzon VS, Masotti S, Toselli S, Albertini A, Celenza F, et al. Weight status and perception of body image in children: the effect of maternal immigrant status. Nutr. J. 2012; 11:85.

27. Lindsay AC, Machado MT, Sussner KM, Hardwick CK, Franco Sansigolo Kerr LR, Peterson KE. Brazilian mothers' beliefs, attitudes and practices related to child weight status and early feeding within the context of nutrition transition. J. Biosoc. Sci. 2009; 41(1):21-37.

28. Silva DA, Andrade GN, Ferreira FMR, Andrade E, Madeira AMF. Percepcion materna sobre el disturbio nutricional del hijo: un estudio comprensivo; Maternal perceptions about the nutritional disorder of the child: a comprehensive study. REME Rev. Min. Enferm. 2011; 15(4):498-503.

29. Moore LC, Harris CV, Bradlyn AS. Exploring the relationship between parental concern and the management of childhood obesity. Matern Child Health J. 2012; 16(4):902-8.

30. Campbell MW-C, Williams J, Hampton A, Wake M. Maternal concern and perceptions of overweight in Australian preschool-aged children. Med. J. Aust. 2006; 184(6):274-7.

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