O Mundo da Saúde, São Paulo - 2017;41(2):180-193
Artigo Original • Original Paper

Influence of behavior and maternal perception on their children's eating and nutritional status#

Influência do comportamento e percepção materna sobre a alimentação e estado nutricional dos filhos

Kathleen Jellmayer*
Aline de Piano Ganen**
Marle Alvarenga***

Abstract

Mothers carry a major responsibility for nutrition and feeding behavior during childhood. The present study aimed to analyze the maternal attitude and perception of the mealtimes and nutritional status of their children. A non-probabilistic sample of 116 mothers and their respective children who go to the Basic Health Units of the City of Sao Paulo, were invited to respond to a Parent Mealtime Action Scale (PMAS) and the Child Feeding Questionnaire (CFQ). The age, income, education and nutritional status of mothers and their children were assessed, and the associations between these characteristics and the PMAS and CFQ scores were examined using linear regression. The correlations between PMAS and CFQ were analyzed by the Spearman test and the nutritional status correlations between mothers and their children, by the Pearson's chi-square. It was found that 71.5% of the mothers and 57.7% of the children were either overweight or obese. The most common positive maternal attitudes according to the PMAS were: daily offer of fruits and vegetables, limits on sweets, and positive persuasion. The negative attitudes were sweet-eating role models, use of rewards and providing many food options. Among the CFQ factors, the most frequent were: perceived responsibility toward their children's food intake, monitoring by mothers of healthy food consumption, junk food restrictions, and exerting pressure to eat. There was a moderate correlation between the nutritional status of the mother and child. It was concluded that the attitudes and perceptions of mothers regarding their children's nutrition vary according to their own nutritional status, as well as the child's.

Keywords: Feeding behavior; nutritional status; child.

Resumo

As mães exercem grande responsabilidade sobre alimentação e comportamento alimentar durante a infância. O presente estudo objetivou analisar as atitudes e percepção materna sobre a alimentação e estado nutricional da criança. Selecionou-se uma amostra não probabilística de 116 mães e respectivos filhos, que frequentam Unidades Básicas de Saúde da Prefeitura de São Paulo. Aplicou-se a Escala de Comportamento dos Pais durante a Refeição (ECPDR) e o Questionário de Alimentação da Criança (QAC) para as mães. Avaliou-se a idade, renda, escolaridade e estado nutricional das mães e filhos e associações entre estas características e os escores da ECPDR e QAC por meio de regressão linear. Analisaram-se correlações entre a ECPDR e QAC pelo teste de Spearman e entre estado nutricional das mães e filhos pelo Qui quadrado de Pearson. Verificou-se que 71,5% das mães e 57,7% dos filhos apresentaram excesso de peso. As atitudes maternas positivas mais presentes segundo ECPDR foram: disponibilidade diária de frutas e hortaliças, limite de guloseimas e persuasão positiva; e as negativas: modelo de guloseima, uso de recompensas e oferecimento de muitas opções alimentares. Pelo QAC, os mais presentes: responsabilidade percebida quanto à alimentação da criança, monitoramento exercido sobre o consumo de alimentos saudáveis, restrição de alimentos não saudáveis e pressão para comer. Houve correlação moderada entre estado nutricional da mãe e do filho. Concluiu-se que as atitudes e percepções maternas relacionadas à alimentação dos filhos variam em função de seu próprio estado nutricional e o da criança.

Palavras-chave: Comportamento alimentar; estado nutricional; criança.

DOI: 10.15343/0104-7809.20174102180193

* Centro Universitário São Camilo, Sao Paulo - SP, Brazil.
** Centro Universitário São Camilo, Sao Paulo - SP, Brazil. E-mail: aline.depiano@gmail.com
*** School of Public Health - University of Sao Paulo. Sao Paulo-SP; Brazil.
#This manuscript is the result of the Master's Dissertation of the student Kathleen Jellmayer, titled Behavior of mothers and maternal perception concerning their children's diet, 2016, Centro Universitário São Camilo.
The authors declare no conflicts of interest.

INTRODUCTION

Childhood obesity has been producing alarming indices, worldwide. According to the World Health Commission (WHO), it is estimated in 2014, 41 million children under 5 years of age were affected by excess weight. The prevalence of obesity in school-age children and adolescents has remained at a plateau in critical regions around the world, however, in absolute numbers, there is a higher incidence of overweight in children living in low- and middle-income countries, than those in high-income countries.[1] The latest data from the 2008-2009 Family Budget Survey (FBS) showed that 33.5% of children between five and nine years old were overweight, 16.6% of boys and 11.8% of girls were obese.[2]

During childhood, the family has a great responsibility not only in supplying the types of food, but also in the formation of nutritional behavior and, consequently, of the nutritional status of the child; thus, designating the parents with the role of being their first nutritional educators.[3] In this context, cultural factors and psychosocial aspects of the family influence the child's feeding experiences from the moment of birth, initiating the learning process.[4] Among the sociocultural factors, the influence of the media on food behavior and satisfaction with the body image of adults and children is highlighted.[5] These means of communication can have an impact on food consumption by influencing decision-making in the acquisition of certain foods, as well as the internalization of specific values in relation to the appearance, idealized model of beauty.[6]

Parents influence children's eating behavior in a variety of ways: they actively make food choices for the family (food and beverage selection); they serve as role models for food choices and how to eat; and they are also models of eating practices to reinforce the development of habits and behaviors.[7]

Recent research conducted in Australia on healthy eating and body image with parents of children aged 1 to 6 years found that parents described healthy eating of children with variety and balance by limiting certain foods such as sugar, salt and processed food. They were well informed about nutrition and had access to healthy food, expressing a desire for more practical information on how to avoid negative body image and promote healthy eating.[8]

The mother is the one who most frequently cares for her children and can contribute to healthy eating standards or unregulated intake, which could lead to obesity, eating disorders (ED), and nutritional deficiencies. In some cases, this can happen when, even in a well-intentioned way, mothers with forceful attitudes impose food practices that do not give children the opportunity to control their own food intake, as well as their choices.[9]

Cross-sectional studies have sought to identify the parental and familiar functioning characteristics that could occur before the onset of ED. Among the results are inadequate parenting pressures, overprotective parents' behavior / high concern, parental indifference, family discord, lack of parental care, and greater adversity, all distinguish patients with ED from those in normal psychiatric conditions.[10] Therefore, research suggests that the family environment, responsible for influencing the eating behavior of children and adolescents, may also be a risk factor for the development of ED.

It is emphasized that knowing the role of the mother and / or the responsible ones can be fundamental for interventions that are more adjusted to the necessary changes of the feeding behavior of the child in the familiar context, since they are the ones that more frequently take care of the children's diet. The present study aimed to analyze the influence of behavior and maternal perception on feeding and on the nutritional status of their children.

MATERIALS AND METHODS

Study Design

This cross-sectional study was carried out in two Basic Health Units (UBS) of the Technical Supervision of Health in Mooca / Aricanduva, belonging to the Southeast Regional Management of the City Health Department - City Hall of the City of Sao Paulo.

After the approval of the project by the ethics committee of the São Camilo University Center (Proposal No. 48/2015) and the Municipal Health Department of the City of São Paulo (Proposal No. 1.239.197), the free and informed consent form was delivered to those responsible.

Sample

Non-probabilistic sample, of convenience, composed by mothers and their respective children attending the UBS's in question. A total of 232 people participated, including 116 mothers and 116 children. Mothers were invited to participate, provided they met the inclusion and exclusion criteria below:

Inclusion criteria:

- Mothers with children of both sexes between 6 and 10 years of age.

The choice of the age group was justified because it was included in the age group indicated in the validation studies of the scales used in this research. In addition, the school phase was chosen because it is considered an important period for the formation of eating habits, with a significant risk of developing obesity.

- Child accompanying the mother in the appointment at the selected UBS's, to evaluate the nutritional status.

Exclusion Criteria:

- Mothers who are illiterate or incapable of responding to research instruments; children with significant allergies or food restrictions, and chronic health problems affecting food, such as: multiple food allergies; metabolic or genetic disorders; anatomical or mechanical problems of the upper respiratory tract or the acquired or congenital gastrointestinal tract, and defects in the larynx, trachea, and esophagus that partially or totally incapacitate oral feeding.

All the mothers who agreed to participate received information about the study according to the Informed Consent Form (ICF). In the case of mothers with more than one child in the age range of the study, she was asked for her to choose one for participation.

Study variables and data collection

Demographic variables

Through the application of the demographic data questionnaire, demographic variables were represented by age (mother and child); sex (mother and child); education; civil status; maternal work; and child's gender.

Nutritional status

The weight (W) and height (H) of mothers and children were measured according to the WHO technical standards[11] adopted by the Ministry of Health[12], in which children were weighed in minimal clothes and mothers in light clothing, both without shoes, in an anthropometric mechanic adult Welmy® scale with a capacity of 150 kg and divisions of 100g, with an anthropometric ruler with a scale of 2.00 meters, used for the measurement of height; all measurements were taken by the researcher. The Body Mass Index (BMI) was calculated following to the formula - BMI = weight/height^2. For the children, the Z-score of the BMI / Age indicated for boys and girls from 5 to 19 years[13] was calculated, and subsequent classification of the nutritional condition.

Socioeconomic Situation

The evaluation of the socioeconomic situation was performed using the Brazilian Economic Classification Criteria (CCEB) – 2015 update - established by the Brazilian Association of Research Companies (ABEP), which identifies the consumption potential of Brazilian households, classifying the population into six socioeconomic strata A, B1, B2, C1, C2 and DE. The CCEB is based on the possession of assets, attaching to each item a number of points, which must be added together and the resulting value identified in the criterion, according to its cut points, the socioeconomic classification of the family.[14] A simplified questionnaire model was suggested for CCEB application.

Evaluation of Mothers' Behavior for Feeding Children

The Escala de Comportamento dos Pais durante a Refeição (ECPDR) is the Portuguese

version of the Parent Mealtime Action Scale (PAMS), recently developed and validated for a US population by Hendy et al.[15] In Brazil, the version was translated and validated by Petty et al.[16], in a study with parents or official caregivers of children aged 6 to 10 years, enrolled in schools in the city of São Paulo. The original scale had a reliability (Cronbach's Alpha) of 0.62 - varying between 0.42 and 0.81 among the 9 domains15; and the validation work found Cronbach's Alpha of 0.61 - ranging from 0.47 to 0.81 between domains.[16]

The questions were answered according to the frequency of practice of each behavior (1-never, 2-sometimes, 3-always). The responses were organized, and to obtain the result of each of the 9 behaviors evaluated, the average of the items that composed each domain was calculated. The frequency of each action was obtained by the average of all responses in each subgroup.

There is no classification system with respective cut-off points to diagnose the score found. According to Petty et al.[16], in their studies for instrument validation and use in the Brazilian population, they have identified an interpretation for the various domains based on the opinions of several authors of studies using these domains.

Assessment of Child Feed Perception

The Questionário de Alimentação da Criança (QAC) is the translated and validated Child Feeding Questionnaire for the Portuguese language, developed by Birch et al.[17], and is considered an appropriate instrument for research with parents of children with normal development. The scale was translated and had its reliability evaluated in Brazil by Miranda da Cruz.[18]

The original scale had a reliability (Cronbach's Alpha) of 0.70 to 0.92 among the 7 factors17; The work of Miranda da Cruz18 did not evaluate the reliability of the application in the Brazilian sample.

This instrument has 31 questions and tests seven factors: four that assess parents' perceptions and concerns and the control of infant feeding practices, and three factors that assess parental attitudes and practices on the control of infant feeding.

Questions were answered according to the intensity of perceptions and attitudes for each of the questions of each factor; there are always five options of answers with corresponding points from 1 to 5. The arithmetic mean of the points of each factor's questions was calculated to determine the factors, and the higher the mean reached the greater the presence of the factor was in the feeding attitudes and practices of the parents.

Statistical Analysis

The data were processed in Stata software, version 13.0. The level of significance was 5%.

The description of the general characteristics of the sample was presented through the distribution of simple, average frequencies, and their respective standard deviations. In the absence of normality of the continuous variables, medians and their respective interquartile intervals (IQ_{25-75}) were used. The descriptions of maternal perceptions and attitudes, measured by the ECPDR and QAC scores, were performed by presenting the medians (IQ_{25-75}) of the total score and each subscale that compose the scores.

Box-type charts were presented to illustrate the median distribution of ECPDR and QAC subclass values (IQ_{25-75}) as a function of the child's nutritional status. For the verification of statistical differences between the scores of each subclass, the Kruskal Wallis test and the Mann-Whitney test were used.

The investigation to see if the general scores of maternal attitudes and perceptions, as well as their subscales, differed according to characteristics of the child and the mother, was performed by means of linear regression. Due to the lack of normality of the QAC score, their values were transformed into a square root unit, since they offered better adjustment.

The association between maternal and child nutritional status was evaluated through Pearson's Chi-Square test. The Spearman correlation test was also used to investigate the relationship between the maternal BMI and the child's BMI (in z-score units). The correlation between the total ECPDR score and the QAC was investigated, as well as the

correlation between each subclass of the QAC with the ECPDR subclasses, using the Spearman correlation test. The reliability of both scales was assessed using Cronbach's Alpha.

RESULTS

116 pairs of mothers and children participated in this study, the characteristics of which are described in table 1.

A majority of the children were older than 8 years [8 ± 1.5 standard deviations (SD)], had at least one sibling, ate meals in the presence of the mother and were overweight, where the BMI / Age average was 1.4 (1.6). Regarding maternal characteristics, the majority were of a social class equal or inferior to C1, were 30 years old or more, with median age = 38 years, and interquartile range (IQ_{25-75}) = 32-43 years, had a partner and were overweight or obese, where the median BMI was 28.4 kg/m2 (IQ25-75 = 24.6-32.9 kg/m2). Half of them worked and studied until high school.

The variables related to dietary attitudes are presented in Tables 2 and 3.

The Cronbach's Alpha in this sample for QAC was 0.88 (ranging from 0.60 to 0.86), and for ECPDR 0.66 (ranging from 0.28 to 0.86).

Observing the medians of the total ECPDR score and its subscales, it was noted that the highest medians were obtained for the domains: daily availability of fruits and vegetables, limit of treats and positive persuasion - all indicative of positive maternal attitudes. The smallest medians were found in the following domains: treat types, use of rewards, and offering of many food options - all related to negative attitudes.

The medians obtained in the QAC subclasses indicated that the most present factors in the mothers evaluated were the perceived responsibility for the child's diet, the mother's monitoring of healthy food intake, the restriction of unhealthy foods, and the pressure to eat. The least present factor was the mother's perception of the child's weight.

Table1 – Descriptive characteristics of the study population. City of Sao Paulo, 2016.

Variables	n (%)
Child Characteristics	
Gender	
Masculine	63 (54,3)
Feminine	53 (45,7)
Age group of the child	
<8 years	45 (38,8)
8-10 years	71 (61,2)
Only Child?	
Yes	32 (27,6)
No	84 (72,4)
Eats with mother?	
Yes	89 (76,7)
No	27 (23,3)
Child's Nutritional Status (BMIz)	
Eutrophia	49 (42,3)

to be continued...

...continuation - Table 1

Overweight	23 (19,8)
Obesity	44 (37,9)
Maternal Characteristics	
Socioeconomic Leve	
A or B	28 (24,1)
C, D or E	88 (75,9)
Mother works?	
Yes	59 (50,9)
No	57 (49,1)
Marital Status	
With partner	94 (81,0)
Without partner	22 (19,0)
*Maternal Education**	
Elementary School	41(35,6)
High School	57 (49,6)
Higher Education	17 (14,8)
Maternal Age	
<30 years	19 (16,4)
30|-40 years	49 (42,2)
≥40 years	48 (41,4)
Mother's Nutritional State (BMI)	
Underweight	2 (1,7)
Eutrophia	31 (26,7)
Overweight	39 (33,6)
Obese	44 (37,9)

BMI = Mother's Body Mass Index
BMIz = Z-score of the child's BMI
* The sample's n for the maternal education variable was of 115 due to the failure by one volunteer to fill out the question.

Table 2 – Descriptive measures of the values obtained in the Scale of Parental Behavior During Mealtimes (ECPDR) and their domains. City of Sao Paulo, 2016.

Variable	Median	IQ $_{25-75}$	Min-Max
ECPDR	68	64-71	49-79
1 – Availability of fruits and vegetables	2,7	2,3-3,0	1,3-3,0
2 – Model of treat consumption	1,7	1,7-2,0	1,0-2,7

to be continued...

...continuation - Table 2

3 – Use of rewards	1,5	1,3-2,0	1,0-2,5
4 – Many food options	1,8	1,5-2,0	1,0-3,0
5 – Fat reduction	2,3	1,7-2,0	1,0-3,0
6 – Special meals	2,3	2,0-2,5	1,5-3,0
7 – Treat limits	3,0	2,3-3,0	1,0-3,0
8 – Positive persuasion	2,8	2,4-3,0	1,0-3,0
9 – Insistence on eating	2,0	1,7-2,7	1,0-3,0

Answer options: 1 (never), 2(sometimes), and 3 (always).

Table 3 – Descriptive measures of the values obtained in the Child Feeding Questionnaire (QAC) and its factors. City of Sao Paulo, 2016.

Variable	Median	IQ_{25-75}	Min-Max
QAC	108	99-114	68-134
1 – Responsibility perceived by the mother concerning the child's diet	4,3	3,7-5,0	1,3-5,0
2 – Mother's perception of her own body weight	3,3	3,0-3,5	2,0-4,3
3 – Mother's perception of her child's weight	2,5	2,0-2,7	1,5-4,2
4 – Mother's concern with child's weight	3,5	2,3-4,7	1,0-5,0
5 – Restriction of unhealthy food	3,8	3,1-4,3	1,1-5,0
6 – Pressure for child to eat	3,8	3,0-4,5	1,0-5,0
7 – Mother's monitoring of child's consumption of unhealthy food	4,3	3,8-5,0	1,0-5,0

Answer options vary from 1 to 5; being that the greater the value is, the greater the evaluated attitude or perception's intensity is.

Scores on the QAC and ECPDR scales were compared according to the nutritional status of the children to assess whether the mothers' perceptions and attitudes varied accordingly. Figures 1 and 2 illustrate these variations.

Figure 1 illustrates the distribution of medians and IQ_{25-75} of ECPDR subscales, according to the child's nutritional status. It was found that the mothers of eutrophic children had significantly higher median values for domains D3 "use of rewards" and D9 "insistence on eating" when compared to the mothers of obese children.

Figure 2 illustrates the distribution of the medians and IQ25-75 of the QAC subscales according to the child's nutritional status. Regarding factors related to maternal perception (F1 to F4), it was observed that mothers of obese children had a lower perceived responsiveness to infant feeding (F1), greater perception of their own body weight (F2), perception of the child's body weight (F3), and concern about the child's weight (F4) when compared to the mothers of eutrophic children. We also verified that mothers of overweight children had a lower perception of the child's body weight (F3) compared to the mothers of obese children, and a greater concern about the child's weight (F4) when compared to the mothers of eutrophic children. In addition, the pressure to eat was significantly higher among mothers of eutrophic children than those of overweight children.

The variation in the QAC and ECPDR scores according to the BMI Z-score of the children, as well as the characteristics of the mothers, was evaluated by linear regression. There was no difference in relation to age groups, education,

marital status, work and socioeconomic status of the mother (data not shown). It is noteworthy that obese and overweight mothers presented a significantly lower ECPDR score than eutrophic mothers, in the order of B-2.58 (IC95% -5.06; -0.10) units of ECPDR for obese mothers and B-2.72 units of ECPDR for overweight mothers (95% CI -5.28; -0.18).

Statistically significant differences were also observed only for the child's BMI, where each unit of increase in the child's BMI increased the QAC score in B -0.08 units (95% CI 0.01; 0.15). An inverse behavior was observed for ECPDR, with a reduction of B-0.69 units (95% CI -1.30; -0.07) in the score with each increase of one unit of the child's BMI.

There was a positive correlation between the nutritional status of the mother and the child. When categorically evaluated, the association between the nutritional status of the mother and the child was observed, that is, in obese mothers, the frequency of obese children is about twice as high (PR = 2.2) when compared to the group of non-obese mothers (p <0.0001).

The Cronbach's Alpha in this sample, for QAC, was 0.88 (ranging from 0.60 to 0.86); and for ECPDR, it was 0.66 (ranging from 0.28 to 0.86). There was a convergence between total QAC and ECPDR scores (Spearman's rho 0.3802; p <0.0001). An exploration of the correlation between the ECPDR domains and the QAC factors was also performed - since the scale scores are not unidirectional.

Table 4 presents the correlation coefficients between the QAC and ECPDR subclasses, as well as explores the correlation of these subclasses with the mother's BMI and the child's BMI (z score).

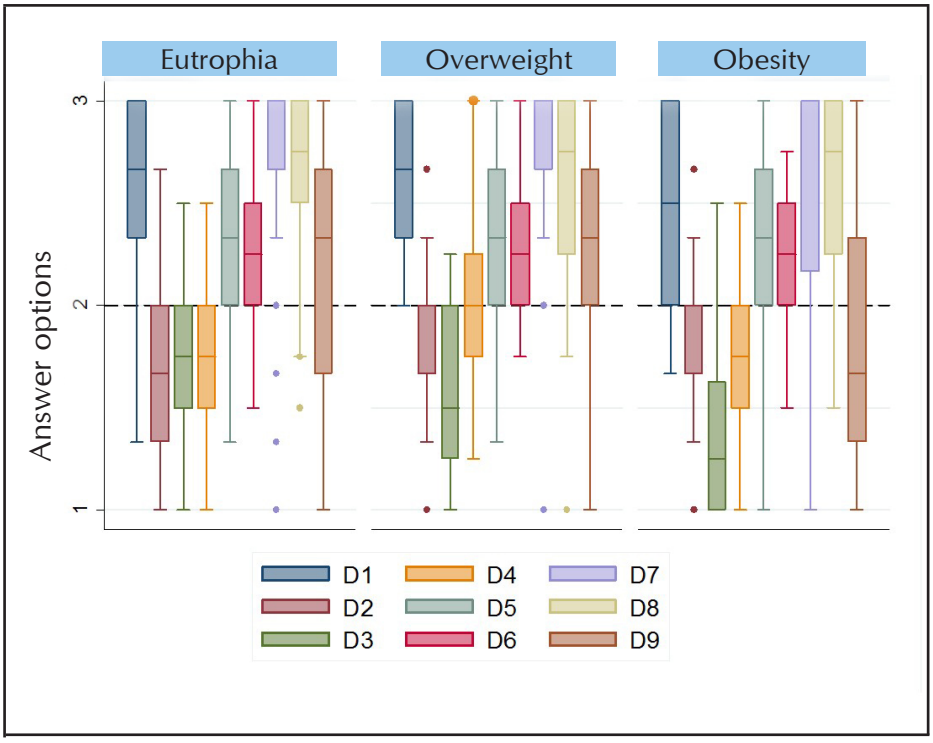

Figure 1 – Box Plot of subscales (domains) of the Parental Behavior During Mealtimes Scale (ECPDR), according to the child's nutritional status. City of Sao Paulo, 2016.

D1 = Availability of Fruits and Vegetables (FV); D2 = model of treat consumption; D3 = use of rewards; D4 = many food options; D5 = fat reduction; D6 = special meals; D7 = treat limits; D9 = insistence on eating. The response options vary from 1 (never), 2 (sometimes) and 3 (always), therefore, the higher the score of the response options, the greater the presence of the evaluated domain. Statistically significant differences (p <0.05) were found for: D3 (Eutrophia X Obesity) and D9 (Eutrophia X Obesity).

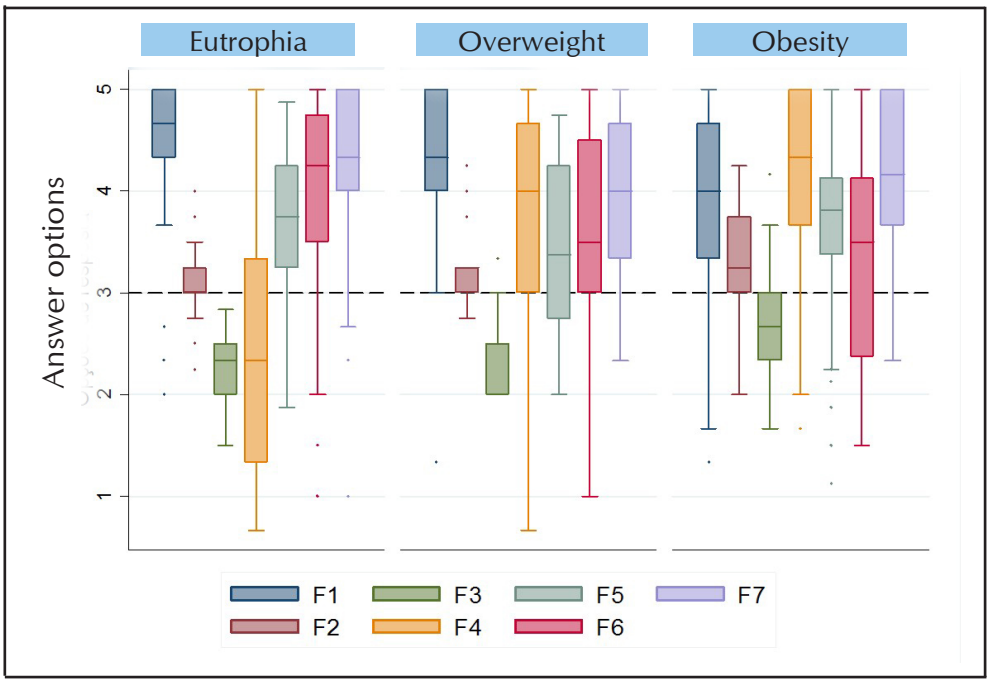

Figure 2 – Box Plot of subscales (factors) of the Child Feeding Questionnaire (QAC), according to the child's nutritional status. City of Sao Paulo, 2016.

F1 = responsibility perceived by the mother regarding the child's diet; F2 = mother's perception of her own body weight; F3 = mother's perception of the child's weight; F4 = mother's concern about the child's weight; F5 = restriction of unhealthy foods; F6 = pressure for the child to eat; F7 = Mother's monitoring of child's consumption of unhealthy. Response options range from 1 to 5, the higher the score of the response options, the greater the presence of the factor. Statistically significant differences ($p < 0.05$) were found for: F1 (Eutrophia X Obesity); F2 (Eutrophia X Obesity); F3 (Eutrophia X Obesity and Overweight X Obesity); F4 (Eutrophia X Overweight and Eutrophia X Obesity); F6 (Eutrophia X Overweight and Eutrophia X Obesity).

The data show that between the subclasses of QAC and ECPDR there are positive correlations between "perceived responsibility by the mother" (F1) with "availability of fruits and vegetables" (D1), "treat limits" (D7) and "positive persuasion" (D8); between "concern about the child's weight" (F4) and "fat reduction" (D5); between "food restriction" (F5) and "use of rewards" (D3), "many food options" (D4), "limit for goodies" (D7) and "positive persuasion" (D8); between "pressure to eat" (F6) and "use of rewards" (D3), "positive persuasion" (D8) and "insistence on eating" (D9); and between "monitoring" (F7) and "FV availability" (D1), "fat reduction" (D5), "treat limits" (D7), "positive persuasion" (D8), and "insistence on eating" (D9).

Negative correlations were observed between "responsibility perceived by the mother" (F1) and "the model of treat consumption" (D2); between "perception of child's weight" (F3) and "use of rewards" (D3) and "insistence on eating" (D9); and between "monitoring" (F7) and "model of treat consumption" (D2). In general, the correlations observed among the subclasses of the scores were weak ($r < 0.4$), with the exception of "pressure to eat" (F6) with "insistence on eating" (D9); "Monitoring" (F7) with "FV availability" (D1); "Monitoring" (F7) with "fat reduction" (D5) and "monitoring" (F7) with "treat limits " (D7) ($r \geq 0,4$).

The mother's BMI was positively correlated with the "perception of her own body weight" (F2) and negatively correlated with "use of

rewards" (D3). The BMI of the child had a positive and weak correlation with "perception of her own body weight" (F2), a moderate correlation with "perception of child's weight" (F3) and "concern about child's weight" (F4), and a negative and weak correlation with "perceived responsibility of the mother" (F1), "pressure to eat" (F6) and "monitoring" (F7). In the analysis of ECPDR subscales with the child's BMI, all significant correlations identified with "FV availability" (D1), "rewards use" (D3), "treat limits" (D7) and "insistence on eating" (D9) were negative and weak (r <0.4).

Maternal BMI was significantly correlated with the child's BMI, with moderate strength (r = 0.44). The association between the presence of maternal obesity and obesity of the child was also explored, finding a positive association (p = 0.000), with a childhood obesity frequency of 25% among non-obese mothers and 58% among obese mothers (data not presented in Tables).

The rate of prevalence of childhood obesity with obese mothers is twice as high as that among non-obese mothers (RP = 2.2; IC95%: 1.2-4.0).

Table 4 – Correlation between all the domains (D1 to D9) of the Parental Behavior during Mealtimes Scale (ECPDR) and the Child Feeding Questionnaire (QAC) factors (F1 to F7) and Body Mass Index (BMI) of mother and child. City of Sao Paulo, 2016.

ECPDR	F1	F2	F3	F4	F5	F6	F7	Mother's BMI	Child's BMI
D1	**0,26***	-0,03	-0,03	-0,07	0,05	0,01	**0,40***	-0,08	**-0,20***
D2	**-0,22***	0,09	0,08	0,06	-0,04	0,05	**-0,21***	0,14	0,13
D3	-0,04	-0,08	**-0,33***	-0,11	**0,38***	**0,30***	0,03	**-0,29***	**-0,35***
D4	-0,15	-0,02	0,12	0,07	**0,18***	0,00	-0,08	-0,02	0,04
D5	0,07	-0,01	-0,01	**0,25***	0,16	-0,02	**0,44***	0,05	0,16
D6	-0,10	-0,04	-0,13	-0,09	-0,12	-0,14	-0,02	-0,09	-0,09
D7	**0,32***	-0,12	-0,05	0,10	**0,22***	0,03	**0,54***	-0,10	**-0,19***
D8	**0,22***	0,02	-0,07	0,08	**0,30***	**0,27***	**0,28***	0,05	0,02
D9	0,12	0,003	**-0,20***	-0,09	0,15	**0,51***	**0,20***	-0,15	**-0,22***
Mother's BMI	-0,002	**0,54***	0,18	0,11	-0,02	-0,11	-0,02	---	–
Child's BMI	**-0,24***	**0,25***	**0,40***	**0,55***	0,07	**-0,28***	-0,07	**0,44***	–

*p<0,05

F1 = responsibility perceived by the mother regarding the child's diet; F2 = mother's perception of her own body weight; F3 = mother's perception of the child's weight; F4 = mother's concern about the child's weight; F5 = restriction of unhealthy foods; F6 = pressure for the child to eat; F7 = mother's monitoring of the child's consumption of unhealthy foods. D1 = availability of FV; D2 = model of treat consumption; D3 = use of rewards; D4 = many food options; D5 = fat reduction; D6 = special meals; D7 = treat limits; D9 = insistence on eating.

DISCUSSION

This study evaluated 116 pairs of mothers and their children to investigate the mother's behavior during meals and her perception about the child's diet. Validated questionnaires were used for this evaluation, and although they have been used previously in national studies, this is the first time that the two - ECPDR and QAC - are used together.

In the sample studied, it was identified that most of the mothers were of a lower class, middle aged (over 30 years), and half worked and had a partner. Such a profile is compatible with the population of UBS users, the place where they were invited to participate in the study. A very expressive number of overweight and obese mothers (more than 70%) were observed, showing a value above that found in the last Family Budget Survey (FBS) 2008-2009[2] for the Brazilian female population that is 48% overweight and 16.9 % obese. Therefore, the frequency of obesity in the present study was more than doubled (37.9%).

The majority of mothers were of a C, D, or E socioeconomic class, and this may be related to the nutritional profile presented when the study points to an increase in excess weight among the less favored classes.[19]

When analyzing the results found for the ECPDR - which evaluates the behavioral dimensions used by the parents at mealtime - the data showed that the most frequent attitudes were the "availability of fruits and vegetables" (FV), the "treat limits" and "positive persuasion"; which are behaviors that can be considered positive.

Petty et al.[16] observed that parents who provided FV to their children and consumed FV rarely prepared differentiated meals for their children. This same study found that 70% of the children had meals with at least one parent or caregiver. This presence may imply motivation and reward through positive attitudes such as verbal praise - which may be associated with increased intake of FV and less use of soft drinks and treats.

In the present study, the majority of the mothers answered that the children eat the meals next to them, showing a positive aspect, provided that maternal attitudes are adequate. The less frequent attitudes pointed out by the mothers were: "model of treat consumption", "use of rewards", and "many food options" - which are all negative. Benton[20] noted that using food as a reward for the ingestion of other foods is common practice in families, but such a strategy actually leads to a decrease in preference for the target food. Thus, these mothers seem to somehow "know" that the use of reward is not appropriate; or just do not do it anyway.

When analyzing the domains of ECPDR according to the nutritional status of the child, it was found that the "use of rewards" and the "insistence on eating" were higher for the mothers of eutrophic children, compared to the mothers of obese children. This finding evidences the influence of maternal attitudes on the nutritional status of their children. It is hypothesized that, because they are overweight, mothers do not use rewards as strategies to increase food consumption, since there is no need. In addition, it was found that the mothers of children with higher BMI values, even though they showed greater concern about their children's weight, also showed less monitoring of meals, less control with the ingestion of sweets, less availability of fruits and vegetables, and less responsibility perceived with feeding of their children in relation to eutrophic children; contributing to the maintenance and / or worsening of nutritional status. That is, it is presumed that it is not clear to these mothers the need to follow, control and even modify their children's meals, even if they are overweight. These findings reflect the importance of awareness through nutritional education so that concern about the child's weight may actually lead to changes in the family's eating behavior.

According to the results obtained in the QAC, the most frequent responses were: "perceived responsibility" for feeding the child, and "monitoring" the consumption of unhealthy foods, followed by "restriction" of unhealthy foods and "pressure to eat". The less present factors were the "mother's perception of the child's weight," "the mother's perception of her own body weight," and "mother's concern about her child's weight."

Miranda da Cruz[18] also identified the

"perception of responsibility" regarding the child's diet as the most frequent factor, and among the less frequent factors, "concern about child's weight", "pressure to eat" and "monitoring" the consumption of non-healthy food. In turn, Lorenzato[21] pointed out the "perception of responsibility", "concern about child's weight", "restriction", and "monitoring" as the most frequent factors; and the "mother's perception of the child's weight," and the "mother's perception of her own body weight" as the less frequent factors.

The QAC was analyzed according to the child's nutritional status. It was found that the "perceived responsibility to child's feeding" was higher in mothers of eutrophic children. On the other hand, "perception of her own weight" was higher in mothers of obese children, and the "perception and concern about the child's weight" was higher in mothers of overweight and obese children.

Lorenzato[21], corroborating the results of our research, found a positive correlation between the BMI variables of the children and the perception and concern of the children's weight. However, in the same study the perceived responsibility also correlated with the child's BMI, in contrast to our finding.

When it comes to body perception, it is known that parents often do not properly perceive that their children are overweight. Camargo[22] found in five of eight articles studied in his review that there is no proper perception of parents regarding the overweight and obesity of their children. Boa-Sorte (2007)[23] also stated that the inadequate perception of children's weight is more frequent in cases where they are obese. Diverging from the latter author, in the present study, the perception was higher for the mothers of obese children - who also said they were more concerned about their children's weight. The question is whether this perception and concern are reflected in better attitudes and behaviors.

It was verified that mothers of eutrophic children reported greater perception of their body weight, as well as the correlation between BMI of mothers and children. Miranda da Cruz[18] did not identify a positive correlation between the BMIs of the children and their mothers, a fact that may be due to a significantly different sample, that is, families of high income social classes (A or B) and a higher level of education - differently of our research. Other studies, however, point to a correlation between the nutritional status of the children and their parents.[24, 25]

The correlation analysis of ECPDR domains and QAC factors with the BMI of the mothers and their children showed that the higher the BMI of the mother, the greater the "perception of her own weight" and the smaller the use of "rewards". This suggests that, because of their own nutritional status and body perception, these overweight mothers may be more concerned about their children's weight gain as well, thus, avoiding the use of rewards during meals; since this feature is usually considered a strategy in an attempt to increase general consumption or increase consumption of a particular food type.

In addition, there was a positive correlation between the child's BMI and the mother's perception of her own body weight, and perception and concern about the child's weight. In contrast, the child's BMI correlated negatively with the pressure to eat, perceived responsibility by the mother, monitoring, availability of FV, use of rewards, treat limits, and insistence on eating. These findings reinforce the influence of maternal attitudes, such as less monitoring, treat limits, and availability of fruits and vegetables in the diagnosis of the nutritional status of the child, reflected weight gain and the development of obesity.

According to the literature, the lack of or lesser maternal perception of the responsibility of feeding their children may imply a commitment to monitoring meals, inadequate dietary practices, which may lead to worsening of the nutritional status of overweight children and adolescents, as well as impair the treatment of these ones.[22]

As a limitation of the study, we can refer to the unsuccessful intake and feeding frequency of the mother-child binomial to estimate the dietary intake and quality of the diet. However, this was the first work that jointly applied QAC and ECPDR, a convergence analysis between these scales, is of great interest. In the case of total scores, there was a weak correlation; and in the subscales, it could be observed that the

majority of correlations were weak and some moderate. Such a result can be considered positive because they show that they relate to and deal with similar constructs, yet they are complementary and are, therefore, useful in the joint application in studies that aim to evaluate maternal attitudes and behaviors regarding the feeding of their children.

CONCLUSION

Overweightness and obesity were prevalent in the study population. Overweight mothers also had overweight children. These showed concern about the nutritional status of the child, but the concern detected was not enough for these mothers to monitor their children's nutrition and to motivate food changes, such as controlling the consumption of treats and increasing the consumption of their children's fruits and vegetables. In addition, it was verified that the perception of responsibility for feeding the child was higher among mothers of eutrophic children than among obese mothers. These findings indicate the maternal influence on their children's diet - which could be reflected in the nutritional state of the mothers themselves. In this way, the importance of nutritional education for the promotion of healthy habits and, consequently, for the prevention and treatment of obesity in childhood is emphasized.

REFERENCES

1. Report of the commission on ending childhood obesity. World Health Organization. 2016.
2. Ministério do Planejamento, Orçamento e Gestão, Instituto Brasileiro de Geografia e Estatística (IBGE) (Brasil). Pesquisa de orçamentos familiares 2008-2009. Antropometria e estado nutricional de crianças, adolescentes e adultos no Brasil. 2010.
3. Costa MGFA, Nunes MJC, Duarte JC, Pereira MAS. Conhecimento dos pais sobre alimentação: construção e validação de um questionário de alimentação infantil. Rev Enf Ref. 2012; 3 (6):55-68.
4. Ramos M, Stein LM. Desenvolvimento do comportamento alimentar infantil. J Pediatr (Rio J). 2000; 76(3):222-237.
5. Moura NC. Influência da mídia no comórtamento alimentar de crianças e adolescents. Segurança Alimentar e nutricional. 2010; 17(1): 113-122.
6. Fortes LS, Morgado FFR, Ferreira MEC. Fatores associados ao comportamento alimentar inadequado em adolescentes escolares. Rev Psiq. Clin.2013; 40 (2):59-64.
7. Birch LL, Savage JS, Ventura A. Influences on the development of children's eating behaviours: from infancy to adolescence. Can J Diet Pract Res. 2007; 68 (1):1-56.
8. Hart LM, Damiano SR, Cornell C, Paxton J. What parents know and want to learn about healthy eating and body image in preschool children: a triangulated qualitative study with parents and Early Childhood. BCM Public Health. 2015; 15:596.
9. Scaglioni S, Salvioni M, Galimberti C. Influence of parental attitudes in the development of children eating behaviour. Br J Nutr. 2008; 99(1):22-25.
10. le Grange D, Lock J, Loeb K, Nicholls D. Academy for Eating Disorders position paper: the role of the family in eating disorders. Int J Eat Disord. 2010;43(1):1-5.
11. Word Health Organization (WHO) (Geneva). Physical status: the use and Interpretation of anthropometry. Report of a WHO Expert Conmittee. 1998b; 854.
12. Brasil. Ministério da Saúde. SISVAN: orientações básicas para a coleta, processamento, análise de dados e informação em serviços de saúde. Brasilia: Ministério da Saúde, 2008. Disponível em:
13. Word Health Organization (WHO) (Geneva). The WHO child growth standards 2006-2007. World Health Organization, Multicentre Growth Reference Study Group, 2007-2007.[acesso em: 05 març.2016 .Disponível em: http://www.who.int/childgrowth.
14. Associação Brasileira de Empresas de Pesquisas (ABEP). Critério de classificação econômica Brasil – CCEB 2015, 2014. Disponível em: http://www.abep.org/criterio-brasil.
15. Hendy HM, Williams KE, Camise TS, Eckman N, Hedemann A. The Parent Mealtime Action Scale (PMAS). Development and association with children's diet and weight. Appetite 2009; 52:328-39.
16. Petty MLB, Escrivão MAMS, Souza AAL. Preliminary validation of the parent mealtime action scale and its association with food intake in children from São Paulo. Brazil. Appetite. 2013; 62:166-172.
17. Miranda da Cruz M. O uso de um questionário de alimentação para estudo de atitudes, crenças e práticas dos pais em relação à alimentação e propensão à obesidade [dissertação]. Ribeirão Preto: Faculdade de Filosofia, Ciências e Letras, Universidade de São Paulo; 2009; 62p. Mestrado.
18. Gigante DP, Moura EC, Vasconcelos LM. Prevalência de excesso de peso e obesidade e fatores associados. Rev. Saúde Publica. 2009; 43(2):83-89.
19. Liping P, Dalenius K, Grummer-Strawn LM. Incidence of Obesity Among Young US Children Living in Low-Income Families. Pediatrics. 2013; 132(6):2008-2011.

20. Benton D. Role of parents in the determination of the food preferences of children and the development of obesity. Int J Obes Relat Metab Disord. 2004 Jul;28(7):858-69.
21. Lorenzato L. Avaliação de atitudes, crenças e práticas de mães em relação à alimentação e obesidade de seus filhos através do uso do Questionário de Alimentação da Criança (QAC) [dissertação]. Ribeirão Preto: Faculdade de Filosofia, Ciências e Letras, Universidade de São Paulo; 2012; 159p. Mestrado.
22.Camargo APPM, Barros AA, Monteiro MARG, Giglio AJS. A não percepção da obesidade pode ser um obstáculo no papel das mães de cuidar de seus filhos. Ciênc. Saúde Coletiva. 2013; 18 (2):323-333.
23.Boa-Sorte N, Neri LA, Leite MEQ, Brito SM, Meirelles AR, Luduvice FBS, et al. Percepção materna e autopercepção do estado nutricional de crianças e adolescentes de escolas privadas. J. Pediatr. 2007; 83 (4):349-356.
24. Birch LL, Ventura AK. Preventing childhood obesity: what works? Int J Obes (Lond). 2009; 33 Suppl 1:S74-81.
25. Sato AF, Jelalian E, Hart CN, Richardson EEE, Mehlenbeck RS, Neill M et al. Associations between parent behavior and adolescent weight control. J Pediatr Psychol. 2010; 36(4): 451-460.

Recebido em maio de 2016.
Aprovado em junho de 2017.