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ROSA LUZ ABUHADBA MOSCOSO

COMPORTAMENTO ALIMENTAR DURANTE O ALEITAMENTO EXCLUSIVO E ESTADO NUTRICIONAL NA PRIMEIRA INFÂNCIA: UM ESTUDO TRANSVERSAL

FEEDING BEHAVIOR DURING THE EXCLUSIVE MILK-FEEDING PERIOD AND NUTRITIONAL STATUS IN EARLY CHILDHOOD: A CROSS-SECTIONAL STUDY

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Dissertação apresentada à Faculdade de Odontologia de Piracicaba da Universidade Estadual de Campinas como parte dos requisitos exigidos para obtenção do título de Mestra em Odontologia na Área de Odontopediatria.

Dissertation presented to the Piracicaba Dental School of the University of Campinas in partial fulfillment of the requirements for the degree of Master in Dentistry in Pediatric Dentistry area.

ORIENTADORA: PROF^{A}. DR^{A}. MARIA BEATRIZ DUARTE GAVIÃO

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RESUMO

A prevalência do sobrepeso e obesidade em crianças menores de cinco anos está aumentando rapidamente no mundo. Fatores individuais como as características do apetite podem explicar respostas diferenciadas frente a um ambiente obesogênico na primeira infância. Os objetivos desta pesquisa foram: (1) Verificar a possível associação do apetite infantil no período de aleitamento exclusivo com os aspectos nutricionais atuais; (2) Observar associações do estado nutricional com fatores sociodemográficos e duração do aleitamento materno exclusivo. A amostra consistiu de 194 crianças de 1,5 a 3,5 anos de idade e as respectivas mães/responsáveis. Os dados sociodemográficos, histórico natal, pós-natal, hábitos alimentares e formas de aleitamento foram informados pelas mães/responsáveis em ficha específica. O comportamento alimentar da criança nos primeiros meses de vida durante o período de aleitamento foi avaliado pela aplicação do Questionário do Comportamento Alimentar do Bebê (BEBQ - versão retrospectiva), o qual é composto por quatro domínios "Prazer em comer", "Resposta ao alimento", "Ingestão lenta", "Resposta à saciedade" e uma questão geral sobre o "Apetite". Foi realizada a adaptação cultural (pré-teste) do BEBQ em 20 mães/responsáveis; todas as questões foram compreendidas em 85% da amostra. Após 15 dias foi aplicado o teste-reteste mostrando replicabilidade excelente (coeficiente de correlação intraclasse = 0,84, $p<0,001$). As variáveis antropométricas foram aferidas seguindo os critérios da Organização Mundial da Saúde (OMS). A normalidade foi avaliada usando o teste de Kolmorogov-Smirnov. A estatística descritiva consistiu de frequências, médias e desvios-padrão. As variaveis quantitativas foram analisadas usando o teste t e coeficiente de Spearman. Modelos de regressão logística univariada e multivariada foram construídos, considerando-se o estado nutricional como variável dependente. O nível de escolaridade materna, a ordem de nascimento, o aleitamento materno, a alimentação equilibrada e o apetite foram considerados como variáveis independentes no modelo univariado. Após esta análise, as variáveis com $p<0,20$ entraram no modelo multivariado. O nível de significância adotado foi de 0,05. Foi observada associação positiva significativa do "Apetite geral" com o estado nutricional ($rs=0,16$, $p=0,025$). Não houve associação dos outros domínios com o estado nutricional ($p>0,05$). Características sociodemográficos e duração do aleitamento materno exclusivo não foram associadas com o estado nutricional ($p>0,05$). Concluiu-se que o apetite infantil

durante o aleitamento exclusivo, aferido pelo “Apetite geral” pode ser um indicador do estado nutricional atual na primeira infância devido a associações significativas positivas com os escores de peso para estatura. Não houve associação entre o estado nutricional com as variáveis sociodemográficas nem com a amamentação exclusiva.

Palavras-chave**:** Apetite, Comportamento alimentar, Estado nutricional, Aleitamento materno, Criança.

ABSTRACT

The prevalence of overweight and obesity in children under 5 years of age is increasing rapidly in the world. Individual factors such as appetite characteristics may explain differentiated responses to an obesogenic environment in early childhood. The objectives of this research were: (1) To verify the possible association of infant appetite in the exclusive milk-feeding period with nutritional aspects; (2) To observe associations of nutritional status with sociodemographic factors and duration of exclusive breastfeeding. The sample consisted of 194 children from 1.5 to 3.5 years old and their respective mothers/guardians. Socio-demographic data, birth and postnatal history, eating habits and forms of milk-feeding were informed by the mothers/guardians in a specific record format. The infant's feeding behavior in the first months of life was evaluated by applying the Baby Eating Behavior Questionnaire (BEBQ - retrospective version), which is composed by four domains "Enjoyment of food", "Food responsiveness", "Slowness in eating ", "Satiety responsiveness" and a geral question about "Appetite". A cultural adaptation (pre-test) was performed in groups of 20 mothers/guardians; all questions were understood in 85% of the sample. After 15 days the test-retest was applied, showing excellent replicability (intraclass correlation coefficient was 0.84; $p<0.001$). Anthropometric variables were measured according to World Health Organization (WHO) criteria. Normality was assessed using the Kolmorogov-Smirnov test and the descriptive statistics consisted of frequencies, means and standard deviations. Quantitative variables were analyzed using the t test and Spearman coefficient. Logistic regression models were constructed, considering nutritional status as a dependent variable; the independent variables in the univariate binary logistic regression were the level of maternal schooling, birth order, breastfeeding, balanced diet, and appetite. Variables with $p <0.20$ entered into the multivariate model. The level of significance was set at 0.05.It was observed a significant positive association between "General appetite"and nutritional status ($p = 0.025$; $rs = 0.16$). No association between the others domains with nutritional status ($p>0.05$) were found. Sociodemographic characteristics and duration of exclusive breastfeeding were not associated with nutritional status ($p>0.05$). It was concluded that infant Appetite when the child was fed milk only as measured by general appetite, might be an indicator of current nutritional status in early childhood due to significant positive associations of general appetite scores with weight-for-length scores. There was no

association between the nutritional status and sociodemographic variables neither with the exclusive breastfeeding.

Key words: Appetite, Feeding behavior, Nutritional status, Breast feeding, Child.

SUMÁRIO

1 INTRODUÇÃO

A prevalência do sobrepeso e obesidade infantil vem aumentando de forma alarmante, uma vez que dados recentes mostram tendência crescente em relação às décadas passadas. No ano 2013, 42 milhões de crianças menores de cinco anos foram acometidas. A continuidade desta tendência fará com que 11% de crianças menores de cinco anos sejam afetadas em 2025 (Sleddens et al., 2008; WHO, 2014). O impacto potencial da obesidade na saúde imediata da criança, no nível de escolaridade e na qualidade de vida é reconhecido (WHO, 2016). Assim, crianças com obesidade são susceptíveis de permanecer obesas quando adultos e em risco de adquirir doenças crônicas. Essas premissas justificam o grande interesse nos estudos sobre fatores de risco do sobrepeso e obesidade (Dubois et al., 2007; WHO, 2016).

O desequilíbrio entre consumo e gasto energético em ambiente obesogênico, onde há grande disponibilidade de alimentos altamente energéticos e de baixo custo acompanhados de estilos de vida sedentários, é amplamente aceito como fator etiológico para o desenvolvimento de sobrepeso e obesidade (Carnell e Wardle, 2008a; WHO, 2016). Fatores individuais, como a preferência alimentar e o apetite, podem determinar diferenças nas respostas dos indivíduos frente ao ambiente obesogênico. Consequentemente, variações nas características do apetite podem explicar a obesidade infantil (Johannsen et al., 2006; Carnell e Wardle, 2008a; Scaglioni et al., 2011; van Jaarsveld et al., 2011).

Nas últimas décadas houve grande interesse em pesquisar comportamentos alimentares e esclarecer a influência do apetite em relação ao estado de peso. Neste contexto, observou-se que crianças e adolescentes com sobrepeso/obesidade foram propensos a ter maior apetite e maior interesse pelos alimentos, acompanhados de sintomas de saciedade prejudicada (Barkeling *et al*., 1992; Carnell e Wardle, 2008a; Webber et al., 2009; Llewellyn et al., 2011; Quah et al., 2015). Por outro lado, Sleddens et al. (2008) observaram em crianças de 6 a 7 anos com índice de massa corporal mais alto, maior tendência a ingestão alimentar, maior disfrute das refeições, acompanhados da ingestão rápida dos alimentos com regulação da saciedade diminuída.

Outros estudos observaram características similares em pré-escolares. Spence et al. (2011) verificaram em crianças de 4 e 5 anos que a ingestão alimentar e a experiência prazerosa da alimentação estavam relacionadas positivamente com o estado de peso, enquanto a regulação da saciedade e o ritmo lento da ingestão relacionaram-se negativamente com o estado de peso. Carnell e Wardle (2008b) observaram que crianças de 3 a 5 anos de idade com estado de peso mais elevado apresentaram apetite maior com regulação deficitária da saciedade, caracterizada pela baixa resposta à saciedade, além de serem mais susceptíveis a comer frente a estímulos alimentares. Nessa direção, comportamentos alimentares parecem estar presentes precocemente na primeira infância e serem relacionados com a prevalência de sobrepeso e obesidade. Dubois et al. (2007) verificaram que crianças com avidez alimentar apresentaram maior propensão de estar com sobrepeso ou com risco de sobrepeso aos 4,5 anos e a manutenção desse comportamento com o tempo favoreceu o aumento da prevalência de sobrepeso. Outro estudo sugeriu que estilos de amamentação vigorosa, caracterizado pela alta pressão de sucção com períodos de descanso curtos no primeiro mês de vida, são previsores da adiposidade nos dois primeiros anos de vida (Agras et al., 1990; Llewellyn et al., 2011). Nessa linha, Stunkard et al. (2004) consideraram que o padrão de sucção mais ávido representa maior risco de obesidade aos dois anos de idade.

Entretanto, pouco se sabe sobre as características precoces do apetite e a respectiva influência sobre o estado de peso na primeira infância; van Jaarsveld et al. (2011), observaram maior apetite, maior prazer na ingestão dos alimentos, maior resposta alimentar e menor sensibilidade à saciedade, aos três meses de idade, que foram relacionados com pesos mais altos aos 9 e 15 meses de idade. Sendo assim, se faz necessário pesquisar se há associação entre o apetite infantil nos primeiros meses de vida e a variação do estado de peso na primeira infância e esclarecer se as características do apetite infantil podem ser preditivas do estado nutricional.

Por outro lado, sabe-se da importância do aleitamento materno exclusivo para o favorável desenvolvimento e crescimento, porém baixas taxas de aleitamento materno exclusivo ainda são prevalentes e perante o aumento da prevalência da obesidade infantil, não está clara a relação com o estado nutricional (Yang e Huffman, 2013). Alguns estudos sugerem que o aleitamento materno teria efeito protetor sobre o sobrepeso e a obesidade

(Yang e Huffman, 2013; Jensen et al., 2015; Victora et al., 2016) e a ausência de práticas de aleitamento materno exclusivo ou a baixa frequência da amamentação representa um risco potencial para desenvolver obesidade infantil (Li et al., 2008). A duração mais longa da amamentação foi associada ao menor risco de sobrepeso na vida adulta (Yang e Huffman, 2013). Li et al. (2008) observaram que a alta intensidade de amamentação durante os primeiros 6 meses de vida, caracterizados pela prática de uma alimentação predominante com leite materno, frequência de amamentação de 80% ou mais, determinou menor tendência de excesso de peso no segundo semestre de vida.

Neste contexto, Jensen et al. (2015) consideraram que a amamentação exclusiva é um fator controlador importante, mas outros fatores, como a introdução e composição dos alimentos, podem também desempenhar papel relevante na prevenção de sobrepeso ou obesidade. Alto consumo de alimentos não saudáveis foi observado em crianças no primeiro ano de vida com mães de nível educacional mais baixo, indicando a necessidade do desenvolvimento de estratégias efetivas para implementação precoce da alimentação adequada com o intuito de prevenir a obesidade e outras doenças (Saldiva et al., 2014). Por sua vez, a escolaridade dos pais tem sido sugerida como preditora do estado de peso, sendo que menor escolaridade estaria associada à obesidade infantil dos três aos seis anos e seus efeitos do sobre o índice de massa corporal, parecem se fortalecer ao longo do tempo (Agras et al.,1990).

Diferentes instrumentos psicométricos têm sido utilizados para avaliar comportamentos alimentares em crianças e adultos, de modo a predizer o risco de distúrbios alimentares e problemas relacionados ao peso corporal (Gallant et al., 2010). Escores obtidos de questionários respondidos pelos pais ou responsáveis são confiáveis, pois estes estão próximos às crianças em praticamente todas as situações, fornecendo assim informações sobre várias situações cotidianas (Livingstone e Robson, 2000). Entre esses instrumentos encontra-se o Questionário do Comportamento Alimentar do Bebê (Baby Eating Behavior Questionnaire, BEBQ, Llewellyn et al., 2011). O BEBQ foi desenvolvido para mensurar o apetite infantil durante o período de alimentação exclusiva com leite por meio de certas características do apetite que correspondem aos seguintes domínios: Resposta aos alimentos, Prazer em comer, Ingestão lenta, Resposta à saciedade e Apetite em geral. Tais domínios e os respectivos itens do BEBQ foram derivados do Children's Eating Behavior

Questionnaire (CEBQ) e suplementados pela literatura relacionada aos comportamentos na amamentação (Llewellyn et al., 2011).

Pelo exposto foi proposto testar as seguintes hipóteses: (1) As variações nas características do apetite estariam relacionadas a diferenças no estado nutricional, sendo eles possíveis preditores de estados de peso. (2) A menor duração do aleitamento materno exclusivo e fatores sociodemográficos, como menor grau de escolaridade materna e ordem decrescente de nascimento, estão relacionados com o estado nutricional alterado e associados a valores mais altos dos Indicadores de peso-para-comprimento/estatura.

Os objetivos deste estudo foram: (1) Avaliar retrospectivamente a associação das características do apetite, no período de aleitamento exclusivo, com o estado nutricional na primeira infância; (2) Observar a possível associação da duração do aleitamento exclusivo e de fatores sociodemográficos com o estado nutricional.

2 ARTIGO:

Feeding Behavior during the exclusive milk-feeding period and nutritional status in early childhood: a cross-sectional study

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Abstract

The increasing trend of overweight and childhood obesity in recent decades has led to a greater interest in researching behavioral predictors that could influence childhood obesity in an obesogenic environment. In that sense, the influences of appetite characteristics during exclusive breastfeeding have received special attention. **Objectives:** (1) To evaluate the possible association of infant appetite in the exclusive milk-feeding period and nutritional status; (2) To observe associations of exclusive breastfeeding and socio-demographic factors with nutritional status in early infancy. **Methods**: Characteristics of infant appetite was evaluated by applying the Baby Eating Behavior Questionnaire (BEBQ - retrospective version) in 194 children aged 30.48 months (SD=6.61 months). The psychometric instrument was adapted in a group of 20 mothers/guardians, being that 85% of them understood all the questions. Anthropometric variables were measured in schools according to the World Health Organization (WHO) criteria. Socio-demographic data, natal history, postnatal care, eating habits and breastfeeding features were provided by mothers/guardians. **Data analysis:** The t test, Spearman coefficient and logistic regression models were applied. **Results:** General appetite was positively correlated with nutritional status ($p = 0.025$; $rs = 0.16$). There was no significant correlation between “Enjoyment of food”, “Food responsiveness”, “Satiety responsiveness”, “Slowness in eating” and nutritional status ($p>0.05$). Sociodemographic characteristics and duration of exclusive breastfeeding were not associated with nutritional status ($p>0.05$). **Conclusions:** The infant appetite during exclusive milk-feeding was positively correlated with the nutritional status in children. Association between sociodemographic variables and nutritional status was not verified. There was no association between the duration of exclusive breastfeeding with current nutritional status.

Key words: Appetite, feeding behavior, nutritional status, breastfeeding, children.

Introduction

The prevalence of childhood overweight and obesity has been increasing at alarming rates (Sleddens et al., 2008; WHO, 2014). The potential impact of these conditions on the immediate and future health of the child is recognized. Currently, overweight and obesity in children are considered a strong predictor of adult obesity, which determines the world interest in the study of the respective risk factors (Dubois et al., 2007; WHO, 2016). It has been suggested that individual factors, such as appetite characteristics, may explain different responses in nutritional states, but genetic and environmental factors are well accepted in the etiology of obesity (Scaglioni et al., 2011; WHO, 2016).

In the last decades, studies have tried to clarify the relation of the infant appetite on nutritional status, taking into account different appetite characteristics, such as enjoying of food, the susceptibility of eating to food stimuli, slowness in eating, and satiety responsiveness at meals. In this way, adolescents and school children with overweight or obesity have been reported to have higher food intake when exposed to food, exhibiting faster food intake, as well as less sensitivity to signs of satiety when compared to their healthy weight counterparts (Barkeling et al., 1992; Carnell and Wardle, 2008a; Webber et al., 2009; Llewellyn et al., 2011; Quah et al., 2015).

Thus, there is a great interest on possible early indicators of future risk of obesity (Agras et al., 1990; Stunkard et al., 2004, Dubois et al., 2007; van Jaarsveld et al., 2011; Llewellyn et al., 2011; Spence et al., 2011). Few studies have examined the possible association of appetite during exclusive milk-feeding with weight status (van Jaarsveld et al., 2011; van Jaarsveld et al., 2014, Quah et al., 2015). In the same way, current research have shown that weighter children at 2 years of age are characterized by a higher food response to food stimuli (van Jaarsveld et al., 2011, Quah et al., 2015), increased appetite, greater food pleasure and less sensitivity to satiety during exclusive milk-feeding (van Jaarsveld et al., 2011).

Different psychometric instruments and behavioral observations have been employed for the study of childhood appetite and obesity. Although behavioral tests provide objective measurements often in laboratory environments, they record the behavior only once, psychometric instruments can be better alternative methodology to register

consistent behavioral styles based on repeated observations of infant feeding (Carnell and Wardle, 2008a). These instruments include the Baby Eating Behavior Questionnaire (BEBQ, Llewellyn et al., 2011). The BEBQ was developed to measure the children's appetite for exclusive milk-feeding period by certain features of appetite: “Food responsiveness”, “Enjoyment of food”, “Slowness in eating”, “Satiety responsiveness” and “General appetite”. These characteristics and the respective BEBQ items were derived from the Children's Eating Behavior Questionnaire (CEBQ) and supplemented by the literature on breastfeeding behaviors (Llewellyn et al., 2011).

Moreover, beside the importance of breastfeeding in the first months for the favorable child growth and development, low rates of exclusive breastfeeding are still prevalent and in the context of increasing prevalence of childhood obesity, the relationship between breastfeeding and nutritional status is still unclear (Yang and Huffman, 2013). The protective effect of exclusive breastfeeding on obesity has been suggested by some research (Yang and Huffman, 2013, Jensen et al., 2015, Victora et al., 2016) and the absence or the low frequency of this feeding practice represents a risk of developing childhood obesity (Li et al., 2008). Also, the long duration of breastfeeding was associated with lower risk of overweight in childhood (Li et al., 2008) and in adult life (Yang and Huffman, 2013).

According to Jensen et al. (2015), the exclusive breastfeeding is an important controlling factor, but other factors, such as the introduction and composition of foods, may also play a relevant role on the prevention of overweight or obesity. Overweight and childhood obesity have been suggested to be associated with family factors, such as birth order, and socioeconomic variables (Ochiai et al., 2012), but the findings are still not consistent. There is evidence suggesting that only child or youngest sibling is associated with an increased risk of overweight or obesity (Hunsberger et al., 2012; Ochiai et al., 2012; Mosli et al., 2015a, b). Other sociodemographic factors, such as the level of parental education, were indicated to influence this disease; findings suggest strong association between parental education and childhood obesity (Lamerz et al., 2005), wherein lower education of the parents was associated with higher body mass index and increased risk of overweight or obesity (Ruiz et al., 2016). In turn, high maternal schooling was related to a lower risk of overweight or obesity and its effects on infant body mass index seem to be significant over time; but some studies show different results (Mosli et al., 2015b).

Considering the increase in overweight and childhood obesity and the complex multifactorial nature of these conditions, in which genetic, environmental and individual factors can interact to develop nutritional changes, it is important to evaluate the early influence of individual factors on the weight status. In this way, the child's appetite is highlighted as a possible predictor of nutritional status in early childhood. Therefore, the objectives of this study were: (1) To retrospectively verify the association of the appetite characteristics, in the exclusive milk-feeding period, with the nutritional status in early infancy; (2) To evaluate the possible association of nutritional status with duration of exclusive breastfeeding and sociodemographic factors.

Material and methods

Study design

This cross-sectional study examined the relationship between characteristics of infant appetite by reporting of eating behaviors in the exclusive (natural and/or artificial) feeding milk period, sociodemographic aspects, and duration of exclusive breastfeeding with nutritional status during infancy. Socioeconomic, gestational data, introduction of complementary feeding, duration and milk-feeding features were obtained in an application form. The nutritional status was evaluated by measuring weight-for-length/height index and anthropometric measurements. Appetite in life's first months was obtained through the household application of the Baby Eating Behavior Questionnaire (BEBQ) - retrospective version (Anexo 1).

Sample Selection

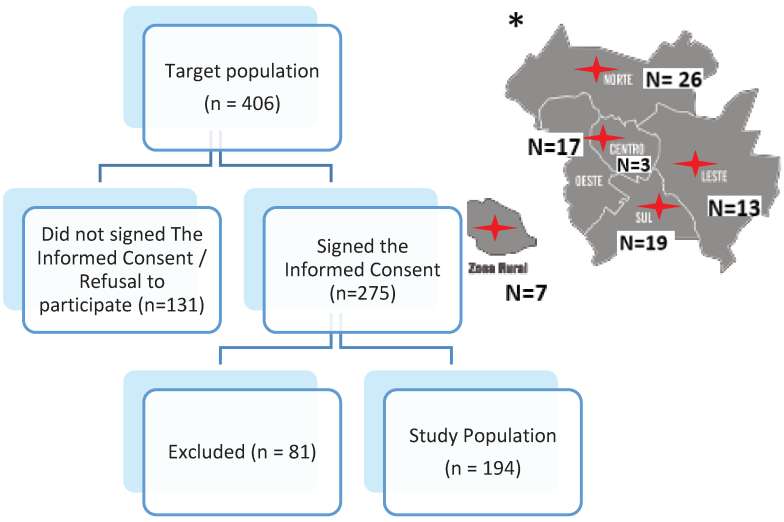
A hundred ninety four children were selected from five public schools in Piracicaba city and the Centro de Convivencia Infantil, CECI-FOP, SP, Brazil. The target group consisted of children aged from 17 to 42 months, with the following inclusion criteria: children of both sexes, whose parents/guardians have signed the Informed Consent.The exclusion criteria were: systemic disorders, neurological disorders, disorders that could compromise the masticatory system, chronic diseases, noncompliant behavior and/or refusal to participate in the study, incomplete information on sociodemographic data and inadequate completion of the questionnaires. This sample number was based on van Jaarsveld *et al*. (2011) research which evaluated the characteristics of the appetite in childhood with the later nutritional status and weight gain in the first 2 years of life in an English population. Considering the correlation coefficient of the "General appetite"domain of this last study (r = 0.346), the test power of 99% and the $\alpha = 0.01$, it was found 188 as the minimum number sample.

Participants

The project was approved by the Ethics Committee of the School of Dentistry of Piracicaba - State University of Campinas - protocol 011/2015.406. Terms of Free and Informed Consent were distributed inviting the mothers/guardians and their children to participate in the study. Clear and detailed information about the procedures, possible

discomforts and benefits of the study were provided to those responsible for the children. From a total of 406 mothers/guardians, 275 accepted the invitation to participate on the study. Following the exclusion criteria, 81 children did not participate in the study because of neurological disorders (03), disorders that compromised the masticatory system (02), difficult behavior (09), did not return the BEBQ (38), did not return information about sociodemographic data (09) and children who participated in the oral health status calibration (20). The age of the children was calculated in months from the date of birth and the date of measurement of the anthropometric measurements. A graphical description of sample selection is given in Figure 1.

Figure 1. Sample selection flowchart



*Public Piracicaba nursery schools; N: school number per region

Sociodemographic characteristics

Socioeconomic data, prenatal, natal, postnatal historic, milk-feeding features and eating habits were obtained from clinical records. These informations were filled at the school by the mothers in meetings supervised by the researcher (RLAM). The volunteers who did not attend at school were approached at home. At that moment, items that characterized inclusion and exclusion criteria were set up. The following data were verified:

• Individual biological characteristics: sex, birth weight, birth order, whether preterm or not (age at birth <37 weeks).

• Sociodemographic factors: maternal education, family income (a minimum wage correspondent to U$ 277.17 during time of sample selection).

• Mother-related factors: mother's age in pregnancy, current age.

• Previous nutritional factors: time and milk-feeding features; mothers/guardians' perception about child appetite (normal, low, high); balanced diet (yes, no).

The Baby Eating Behavior Questionnaire (BEBQ)

The BEBQ-retrospective version evaluates the appetitive characteristics by recording certain feeding behaviors in the period in which the children were fed exclusively with breast milk or formula, obtaining information about the infant appetite in that period. The questionnaire consists of 18 multiple choice questions with five domains. Four of these domains describe different appetitive characteristics and one item (question 4) describes the General appetite: (1) "Food responsiveness" (questions 2, 8, 12, 14, 16, 18); (2) "Enjoyment of food" (questions 1, 3, 6, 17) - both domains assess interest in food; (3) "Satiety responsiveness" assesses appetite regulation ability (questions 7, 10, 13); (4) "Slowness in eating" related to lack of interest in food (questions 5, 9, 11, 15). This instrument was filled out by parents and the answers are given in a Likert scale of 5 options: never, rarely, sometimes, frequently or always, with the respective scores being 1, 2, 3, 4, and 5.

Cultural Adaptation (pre-test) of the BEBQ

The questionnaire was translated and adapted culturally to the Brazilian Portuguese by the Professor PhD. Patrícia Pelufo Silveira, Faculty of Medicine - Federal University of Rio Grande do Sul, Porto Alegre, Brazil. The pre-test was performed to verify the understanding of the instrument, since the questionnaire was translated and adapted in another region of the country; therefore, regional diversities could make it difficult to understand the BEBQ. At this stage, the questionnaires were applied at home to 20 mothers of children attending a public school in Limeira city, SP, Brazil. To each question in the questionnaire was added the alternative "I did not understand", in order to identify issues that could not be understood. Cultural equivalence was established according to the criteria of Guillemin et al. (1993) in

which at least 85% of individuals should not show difficulty in answering each question. The level of misunderstanding of the questionnaire did not exceed 15% and questions 12, 13, 16, 17, 18 appeared to be incomprehensible in three participants, but the instrument seems to be considered culturally adapted.

BEBQ Application and Test-retest

The BEBQ was distributed in schools and applied at home to 232 mothers. After, 194 questionnaires returned. To evaluate the reliability of the instrument, 100 of the volunteers were invited to retake the questionnaire (test-retest) 15 days after the first application, as suggested by Ciconelli et al. (1999); 49 questionnaires returned.

Nutritional Status Assessment

Nutritional status was assessed by measuring the z-score weight-for-length/height indicator, adjusted for age and sex, according to the WHO Child Growth Standards (WHO Multicentre Growth Reference Study Group, 2006; OMS, 2008) for children under five years old.

Weight-for-length/height indicator

The measurement of weight and length/height was performed at school. Figure 2 shows the cutoff points and nutritional diagnosis of the weight-for-length/height indicator in children under five years.

Figura 2. Cut-off points for weight-for-length/height indicator to children (0 - 5 y)

Critical values		**Nutritional Diagnosis**
< Percentile 0,1	< Score z -3	Severe thinness
≥ Percentile 0,1 e < Percentile 3	≥ Score z -3 e < Score z -2	Thinness
≥ Percentile 3 e ≤ Percentile 85	≥ Score z -2 e ≤ Score z +1	Eutrophy
>Percentile 85 e ≤ Percentile 97	> Score z +1 e ≤ Score z +2	Risk of Overweight
> Percentile 97 e ≤ Percentile 99,9	> Score z +2 e ≤ Score z +3	Overweight
> Percentile 99,9	> Score z+3	Obese

Source: OMS, 2006

Data on anthropometry were classified by WHO Anthro version 3.2.2, and the percentile and z-score weight-for-length/height values were measured. WHO Antro 3.2.2 is a software to evaluate the growth and development of children worldwide and was developed to facilitate the application of new curves. The adopted anthropometric reference recommends the enforcement of the weight-for-length/height indicator only for children under 5 years. The body mass index should be used to assess the nutritional status in children older than 5 years.

Children under 2 years

The weight of children under two years old was measured using a W920 portable digital scale with tare function (WISO, São Jose/SC, Brazil), with a capacity of 200kg and a precision of 50g. The child was weighed in light clothes and carried in researcher´s arms. The tare function decreases the weight of the person holding the child. The length was obtained with the child lying down, without shoes and without props in the head that could interfere in the measurement, as well as any type of hairstyle. A Wood WCS portable horizontal stadiometer (WCS, Curitiba/PR, Brazil) was used, with a capacity of 99cm and division of 1mm. When the child lies in the center of the equipment, the upper part of the head rests firmly against the fixed part of the equipment, with the neck straight and the chin away from the chest; the arms extended along the body; the heels, calves, glutes, scapulae and the occipital region of the child in full contact with the surface that supports the stadiometer, keeping the head in the vertical plane of Frankfurt. The child's knees were carefully pressed with one hand so that they were stretched out, feet together at a right angle to the legs. All the equipment was placed on a firm and resistant surface. The weight and length were recorded in a specific file recording the evaluation date.

Children over 2 years old

The weight of children over two years old was evaluated using a portable digital scale W920 (WISO, São Jose/SC, Brazil), with a capacity of 200kg and graduation of 50g, supported on a smooth and level surface. The child was weighed in light clothing and without shoes, with the feet in the center of the scale slightly apart, erect and with the arms extended along the body. The stature was measured with a tape-measuring of 1.5m capacity and 1mm

precision glued on a smooth and rigid vertical surface. The child was positioned erect, barefoot, with arms extended along the body; the ankles, calves, glutes, scapulae, and occipital region resting on the vertical surface supporting the tape-measuring, keeping the head free of props and with the Frankfurt Plane in the horizontal plane.

Statistical analysis

Data normality was assessed using the Kolmogorov-Smirnov test with Lilliefors significance correction to address parametric or non-parametric tests. Descriptive statistics were used to describe the sample. Quantitative variables were analysed using t test and Spearman coefficient. The reliability of the questionnaire was checked using the intraclass correlation coefficient for data of the test-retest. Logistic regression models were built with nutritional status as dependent variable. Initially, univariate binary logistic regression was applied, creating dummy variables for mother education and birth order. Breastfeeding was dychtomyzed as “at least five months” (0) or “less than five month” (1), balancead feed as “yes” (0) and “no” (1), appetite as “normal and low” (0) and high (1). Variables with $p < 0.20$ in univariate binary logistic regression composed the multivariate model. The statistical program used for data analysis was SPSS 22.0. Significance level was set at 0.05.

Results

Sociodemographic characteristics of the sample

Table 1 describes the characteristics of the study sample. There were more males than females, with a mean age of 30.48 (SD=6.61) months. Both the age of the girls and boys and of the total sample was similar, since the mean age and dispersion were very similar. Approximately a quarter of the sample was between 1.5 and 2 years old, around 50% of the children were from 2 to 3 years and 23% were older than 3 years.

Regarding the level of maternal education, high school was prevalent followed by the higher education level. There was low frequency of maternal primary education (elementary school). Around 60% of the children lived in a family with a monthly income with more than one and up to three minimum wages, while 22.16% of the sample came from families with more than three minimum wages, as seen on table 1.

On the other hand, most children were within the normal nutritional pattern of eutrophy; around a quarter of the sample was at risk of overweight and 3.61% presented overweight/obesity. The mean of the exclusive breastfeeding period was 3.58 months and 40.72% of the sample received exclusive natural feeding for a period of at least 5 months, but with a low frequency of exclusive breastfeeding of 6 months (9.28%).

Table 1. Sociodemographic characteristics of the sample

	Characteristic	Female [n (%)] n = 91 (46.90%)	Male [n (%)] n = 103 (53.09%)	Total [n (%)] n = 194
Age	17-24 month	21 (10.82%)	23 (11.86%)	44 (22.68%)
	25-36 month	45 (23.20%)	60 (30.93%)	105 (54.12%)
	37-42 month	25 (12.89%)	20 (10.31%)	45 (23.20%)
	Mean (SD)	**30.65 (7.33)**	**29.66 (6.85)**	**30.48 (6.61)**
Mother education	Uneducated	0	1 (0.51%)	1 (0.51%)
	Elementary School	7 (3.61%)	18 (9.28%)	25 (12.89%)
	High School	57 (29.38%)	69 (35.57%)	126 (64.95%)
	College/University	26 (13.40%)	15 (7.73%)	41 (21.13%)
	Not report	1 (0.51%)	0	1 (0.51%)
Familiar income (Minimum salary)	Until 1	6 (0.31%)	11 (5.67%)	17 (8.76%)
	Until 2	29 (14.95%)	37 (19.07%)	66 (34.02%)
	Until 3	24 (12.37%)	29 (14.95%)	53 (27.32%)
	More than 3	22 (11.34%)	21 (10.82%)	43 (22.16%)
	Not report	10 (5.15%)	5 (2.58%)	15 (7.73%)
Height (SD)	Range: 77 – 106.4	91.58 (5.69)	92.34 (5.24)	91.98 (5.24)
Weight (SD)	Range: 9.3 – 22.6	13.84 (2.4)	13.97 (1.83)	13.91 (2.11)
Score z (SD)	Range: -3.92 – 3.55	0.57 (1.06)	0.45 (0.97)	0.50 (1.01)
Nutricional status	Obesity	3 (1.55%)	0	3 (1.55%)
	Overweight	3 (1.55%)	1 (0.52%)	4 (2.06%)
	Risk of overweight	18 (9.28%)	25 (12.89%)	43 (22.16%)
	Eutrophy	67 (34.53%)	76 (39.18%)	143 (73.71%)
	Severe thinness	0	1 (0.52%)	1 (0.52%)
Duration of exclusive breastfeeding	0 – 1.5 months	17 (8.76%)	18 (9.28%)	35 (18.04%)
	2 – 4 months	44 (22.68%)	36 (18.56%)	80 (41.24%)
	5 months	21 (10.82%)	37 (19.07%)	58 (29.89%)
	5.5 months	3 (1.55%)	0 (0%)	3 (1.55%)
	6 months	6 (3.09%)	12 (6.19%)	18 (9.28%)
	Mean (SD)	**3.44 (1.86)**	**3.70 (1.94)**	**3.58 (1.90)**

SD: Standard Deviation

Replicability of the Instrument

A decreasing trend on giving back the questionnaires was noticed (the test response rate was 83.6% and the test-retest response rate was 49%), showing an aproximate fall of 50%. To verify the replicability of the instrument, the intraclass correlation coefficient was determined (ICCs = 0.84; p<0.001), showing excellent result according to the criteria of Fleiss et al (1986). The ICCs was evaluated for each domain of the instrument, showing from mean to good replicability the following domains: “Enjoyment of food” (ICCs = 0.62, p<0.0001); “Satiety responsiveness” (ICCs = 0.72, p<0.0001); “Slowness in eating” (ICC = 0.63, p<0.0001); and “General appetite” (ICC = 0.70, p<0.0001). There was an excellent replicability for the “Food responsiveness” domain (ICCs = 0.90, p<0.0001).

Appetitive characteristics in the exclusive milk- feeding period

Descriptive analysis of appetitive characteristics

The mean scores of the domains and averages of the total BEBQ scores are shown on Table 2. Higher scores indicated greater food enjoyment, greater “Food responsiveness”, slower feeding and high sensitivity to satiety. Most of the mothers reported the “General appetite”of the children as good, since they often had enough appetite (4.40). The high scores for the “Enjoyment of food” domain indicated that the children enjoyed the feeding in those first months. Interestingly, scores from 1 to 5 were observed in girls, whereas in boys the scores were from 3 to 5. Some mothers perceived in their children a low satiety sensitivity and low scores of “Slowness in eating “.

The statistical analysis of the comparison of scores between sexes and domains of the instrument were performed by the independent *t* test, but there was no significant differences between sexes (p>0.05).

Table 2. Mean scores of BEBQ and the respective domains (Questions 5 and 6 reversed)

	Total Score	Enjoyment of food	Food responsiveness	Slowness in eating	Satiety responsiveness	General appetite
Females (n = 91)						
Mean (SD)	3.06 (0.48)	4.68 (0.42)	2.56 (0.96)	2.87 (0.63)	2.39 (0.75)	4.37 (1.02)
Median (ID)	3.02 (0.73)	4.75 (0.5)	2.5 (1.5)	2.75 (0.75)	2.33 (1)	5 (1)
Minimum – Maximum	1.9 – 4.2	1 – 4.83	1 – 4.83	1.25 – 4.25	1 – 4.33	1 – 5
Males (n = 103)						
Mean (SD)	3.13 (0.46)	4.71 (0.39)	2.77 (0.94)	2.70 (0.71)	2.46 (0.82)	4.42 (0.98)
Median (ID)	3.08 (0.57)	4.75 (0.5)	2.83 (1.5)	2.75 (1)	2.33 (1.17)	5 (1)
Minimum – Maximum	2.17 – 4.37	3 – 5	1 – 5	1 – 4.5	1 – 5	1 – 5
Total sample (n = 194)						
Mean (SD)	3.09 (0.47)	4.70 (0.40)	2.67 (0.05)	2.78 (0.68)	2.43 (0.79)	4.40 (0.99)
Median (ID)	3.07 (0.63)	4.75 (0.50)	2.56 (1.5)	2.75 (0.75)	2.33 (1)	5 (1)
Minimum - Maximum	1.90 – 4.37	3 – 5	1 – 5	1 – 4.5	1 – 5	1 – 5

SD: Standar desviation, ID: Interquartile range. There was no difference between sex in the total scores and BEBQ domains (independent *t*-test)

Correlation between appetitive characteristics

The correlations between the means of the instrument domains are shown on Table 3. There were significant correlations, although weak: “General appetite”correlated positively with “Enjoyment of food” and with “Food responsiveness” and negatively with “Satiety responsiveness”. “Enjoyment of food” correlated negatively with the “Food responsiveness”.

Table 3. Correlation between the appetitive characteristics in the exclusive milk-feeding period (N=194)

		Enjoyment of food	Food responsiveness	Slowness in eating	Satiety responsiveness	General Appetite
Food responsiveness	*Rs*	- 0.153*	-			
	Valor de *P*	0.033	.			
Slowness in eating	*Rs*	0.056	0.058	-		
	Valor de *P*	0.439	0.422	.		
Satiety responsiveness	*Rs*	- 0.031	0.030	0.016	-	
	Valor de *P*	0.667	0.679	0.825	.	
General Appetite	*Rs*	0.150*	0.143*	0.027	- 0.156*	-
	Valor de *p*	0.037	0.047	0.709	0.030	.

*Significant correlation p ≤ 0.05, rs - Spearman correlation coefficient

Retrospective association of infant appetite with nutritional status

All of the characteristics of appetite in the exclusive milk-feeding period were retrospectively associated with the current weight-for-length/height index. There was a significant positive correlation of infant appetite, measured by general appetite, with nutritional status, ie the greater the anthropometric variable, the greater the overall appetite (Table 4). Positive correlations of “Food responsiveness” (P = 0.08), negative correlations of “Slowness in eating” (P = 0.20) and “Satiety responsiveness” (P = 0.88) with nutritional status were verified (Appendix 2).

Table 4. Correlation between “General appetite”and weight-for-length/height indicator

	rs	*P Value*
Score z and general appetite (n = 194)	0.16	0.0245*
Percentile and general appetite (n = 194)	0.16	0.0254*

*Significant correlation p≤ 0.05; rs: Spearman correlation coefficient

Association of breastfeeding and sociodemographic characteristics with nutritional status

There was no association between maternal education level, birth order and exclusive breastfeeding with nutritional status. The results of univariate binary logistic regression considering nutritional status as dependent variable are presented in Table 5. The multivariate binary logistic regression was built with the following variables: maternal education, firstborn son, balanced diet and appetite (p<0.20) (Appendix 2). It was verified that those variables were not associated with nutritional status, although the multivariate model had been significant (p = 0.033).

Table 5. Association of sociodemographic characteristics with nutritional status (univariate binary logistic regression)

	Characteristic	OR	*P* value
Nutritional status	Sex	0.998	0.996
	Elementary School	0.772	0.187*
	High School	1.484	0.273
	College/University	0.943	0.886
	Firstborn	0.497	0.037*
	Middle child	0.272	0.209
	Youngest son	1.131	0.692
	Exclusive breastfeeding for at least 5 months	1.367	0.364
	Balanced diet (no)	2.312	0.194*
	Appetite (high)	1.971	0.057*

*Variables that entered the multiple model (P <0.20).

Discussion

The present study evaluated infant appetite using the BEBQ, which is a reliable and validated instrument to record behavioral observations of appetite in the exclusive milk-feeding period. To our knowledge, only three studies (Quah et al., 2015, van Jaarsveld et al., 2014, van Jaarsveld et al., 2011) have been published that relate characteristics of appetite to subsequent anthropometric variables in early childhood, using the same Instrument applied in the present research.

This study showed that the children in the exclusive milk-feeding period were characterized by a good appetite and a pleasurable feeding, according to the perception of the mothers who assigned high scores in the "General appetite" domain (4.40) and in the "Enjoyment of food" (4.70). Similar results were found by van Jaarsveld et al. (2011) and Llewellyn et al. (2011).

The correlations between “General appetite” with “Enjoyment of food” and “Food responsiveness” were positive but weak. There was also a weak negative correlation between “General appetite” and “Satiety responsiveness” domains. Such findings are in concordance with the results of Llewellyn et al. (2011), although they found moderate correlations, probably because of the sample size of 2402 participants. From these results, it can be inferred that children with higher appetite in the first months of life showed a tendency to enjoy pleasurable feeding, being less sensitive to signs of satiety, presenting a greater interest in food in the first months of life, reflecting a natural mechanism to guarantee sufficient food and energy inputs for growth.

The significant positive association of infant appetite, measured by “General appetite”, with weight-for-length/height indicator was in agreement with van Jaarsveld et al. (2011, 2014). Although this correlation had been weak, this result infers that infant appetite during exclusive milk-feeding may be an early indicator of future nutritional status. However, longitudinal studies that accompany its influence on nutritional status in the short and medium term are necessary.

The other domains, “Enjoyment of food”, “Food responsiveness”, “Slowness in eating” and “Satiety responsiveness” were not correlated with current nutritional status. Similar results were found by Cao et al. (2012) and Quah et al. (2015), but divergent from

van Jaarsveld et al. (2011, 2014). This disagreement could be influenced by the design of these studies, since they had twins as target population, who have different weights and growths in childhood compared to children who are from single pregnancies (Buckler et al., 2004), as in this study. In addition, non-standardization in the child growth benchmark adopted in different studies could have influenced, since there is no consensus. For instance, van Jaarsvelt et al. (2011) used the British 1990 Growth Reference Data, being that weight standar desviation of 0 indicated an average weight; >0 indicated a higher weight, and <0 indicated a lower weight, different from this study that used the WHO Child Growth Standards, which was released in 2006 for assessment of growth and nutritional status in preschool children in any country (WHO Multicentre Growth Reference Study Group, 2006).

The protective effect of breastfeeding on the infections in young children is known. It has been suggested that breastfeeding would also have protective effect for overweight and obesity (Yang and Huffman, 2013). Victora et al. (2016) found a protective effect against overweight and diabetes. Similar findings were demonstrated by the study of Li et al. (2008), in which children who were preferably breastfed for the first 6 months had a lower risk of overweight and subsequent obesity. The present study found no association between duration of exclusive breastfeeding and nutritional status that can be attributed to the relatively low number of infants who received exclusive breastfeeding at least 5 months of age.

Being a first-born was significantly associated with nutritional status in univariate analysis. However, in the multivariate model, such association was not significant, showing that in the present study birth order did not determine the chance of children being at risk of overweight, overweight or obesity. According to Hunsberger et al. (2012), only child school-aged was at greater risk of being overweight than children with siblings, whereas for Mosli et al. (2015a,b) younger siblings were more likely to be overweight or obese than older siblings. Such discrepant results can be attributed to the lower frequency of overweight and obesity found in the present study, as well as some methodological differences, such as the early age of the participants (1.5 – 3.5 years), being those periods of greater control feeding by the parents. In this line, Hunsberger et al. (2012) found a greater risk of overweight in only child school-age (6 ≤ and ≤9 years) than those in preschool age (2≤ and <6 years).

There was no association between the level of maternal education and the current nutritional status. In addition, most of mothers (65%) had the same level of education (high school). Similar results were obtained by Mosli et al. (2005). However, previous studies have found that the lower level of education was related to higher weight or obesity (Agras et al., 1990; Webber et al., 2010).

The frequency of overweight/obesity was 3.61%, below WHO data (2016) for Brazilian children under 60 months (5.0% to 9.9%). However, the maximum children age in the present study was 42 months. There was no significant difference in the frequency of overweight or obesity among boys and girls, as found by Li et al. (2008). However, Mostli et al. (2015b) and Ochiai et al. (2012) observed a significant variation in prevalence among boys and girls, and such as differences could be influenced by the volunteer ages.

It must be considered that, 23% of the sample were in the age group of 37 to 42 months, and the time elapsed from the time of milk-feeding until the application of BEBQ can be considered long and have influenced the respective BEBQ responses by the memory bias of the mothers. However, there is evidence that parents are reliable informants about their children's food intake in the home environment (Livingstone et al., 2000) and can provide consistent observations of behavioral eating habits (Carnell and Wardle, 2008a).

A relevant aspect in this study is related to the characteristics of the sample, since children from schools of urban and rural areas were approached. This contributes to the representativeness of the sample relative to the population of the Piracicaba city.

Conclusion

The infant appetite, as measured by general appetite, was positively associated with the nutritional status. This supports the hypothesis that it may be an early predictor and explain in part the condition of nutritional status in early childhood. There was no association between maternal schooling, birth order and exclusive breastfeeding with nutritional status.

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Authors Contributions

MBDG participated in the design and design of study, data analysis, interpretation and revision of the manuscript. RLAM participated in the design of the study, data collection and writing of the manuscript. The authors agree on the final version of the paper.

Referências

1. Agras WS, Kraemer HC, Berkowitz RI, Hammer LD. Influence of early feeding style on adiposity al 6 years of age. J Pediatr.1990;116(5):805-9.
2. Barkeling B, Ekman S, Rossner S. Eating behavior in obese and normal weight 11-year-old children. Int J Obes Relat Metab Disord. 1992;16(5): 355–60.
3. Buckler JM, Green M. A comparison of the early growth of twins and singletons. Ann Hum Biol. 2004;31(3):311-32.
4. Carnell S, Wardle J. Appetitive traits and child obesity: measurement, origins and implications for intervention. Proc Nutr Soc. 2008; 67(4):343-55.
5. Cao YT, Svensson V, Marcus C, Zhang J, Zhang JD, Sobko T. Eating behaviour patterns in Chinese children aged 12-18 months and association with relative weight - factorial validation of the Children's Eating Behaviour Questionnaire. Int J Behav Nutr Phys Act. 2012; 9(5): 1-7.
6. Ciconelli RM, Ferraz MB, Santos W, Meinão I, Quaresma MR.Tradução para a língua portuguesa e validação do questionário genérico de avaliação de qualidade de vida SF-36(Brasil SF 36). Rev Bras Reumatol. 1999; 39(3): 143-50.
7. Dubois L, Farmer A, Girard M, Peterson K, Tatone-Tokuda F. Problem eating behaviors related to social factors and body weight in preschool children: A longitudinal study. Int J Behav Nutr Phys Act. 2007;4(4): 1-10.
8. Fleiss JL. The Design and Analysis of Clinical Experiments. New York. JOHN WILEY & SONS, INC. 1986

9. Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. J Clin Epidemiol 1993; 46(12):1417-32.
10. Hunsberger M, Formisano A, Reisch LA, Bammann K, Moreno L, De Henauw S et al. Overweight in singletons compared to children with siblings: the IDEFICS study. Nutr Diabetes. 2012;2(35):1-3
11. Jensen SM, Ritz C, Ejlerskov KT, Mølgaard C, Michaelsen KF. Infant BMI peak, breastfeeding, and body composition at age 3 y. Am J Clin Nutr. 2015;101(2):319-25.
12. Lamerz A, Kuepper-Nybelen J, Wehle C, Bruning N, Trost-Brinkhues G, Brenner H et al. Int J Obes (Lond). Social class, parental education, and obesity prevalence in a study of six-year-old children in Germany. 2005 ;29(4):373-80.
13. Li R, Fein SB, Grummer-Strawn LM. Association of Breastfeeding Intensity and Bottle-Emptying Behaviors at Early Infancy with Infants' Risk for Excess Weight at Late Infancy. Pediatrics. 2008; 122(2): 77-84.
14. Livingstone MB, Robson PJ: Measurement of dietary intake in children. Proc Nutr Soc 2000; 59(2):279-93.
15. Llewellyn CH, van Jaarsveld CH, Johnson L, Carnell S, Wardle J. Development and factor structure of the Baby Eating Behaviour Questionnaire in the Gemini birth cohort. Appetite. 2011;57(2):388-96.
16. Mosli RH, Lumeng JC, Kaciroti N, Peterson KE, Rosenblum K, Baylin A et al. Higher weight status of only and last-born children. Maternal feeding and child eating behaviorsas underlying processes among 4-8 year olds. Appetite. 2015;92:167-72.
17. Mosli RH, Miller AL, Peterson KE, Kaciroti N, Rosenblum K, Baylin A et al. Birth order and sibship composition as predictors of overweight or obesity among low-income 4- to 8-year-old children. Pediatr Obes. 2016;11(1):40-6.
18. Ochiai H, Shirasawa T, Ohtsu T, Nishimura R, Morimoto A, Obuchi R et al. Number of siblings, birth order, and childhood overweight: a population-based cross-sectional study in Japan. BMC Public Health. 2012;12: 1-7.
19. Organización Mundial de la Salud 2008.Patrones de Crecimiento del Niño la OMS: Curso de Capacitación sobre la Evaluación del Crecimiento del Niño. Ginebra, OMS, 2008.

20. Quah PL, Chan YH, Aris IM, Pang WW, Toh JY, Tint MT *et al* .Prospective associations of appetitive traits at 3 and 12 months of age with body mass index and weight gain in the first 2 years of life. BMC Pediatr. 2015; 12(15):1-10.
21. Ruiz M, Goldblatt P, Morrison J, Porta D, Forastiere F, Hryhorczuk D et al. Impact of Low Maternal Education on Early Childhood Overweight and Obesity in Europe. Paediatr Perinat Epidemiol. 2016;30(3):274-84.
22. Scaglioni S, Arrizza Ch, Vecchi F, Tedeschi S. DeteRminants of children's eating behavior. Am J Clin Nutr. 2011;94(6):2006–11.
23. Sleddens EF, Kremers SP, Thijs C. The Children's Eating Behaviour Questionnaire: factorial validity and association with Body Mass Index in Dutch children aged 6–7. Int J Behav Nutr Phys Act. 2008;20(5): 1-9.
24. Spence JC, Carson V, Casey L, Boule N. Examining behavioural susceptibility to obesity among Canadian pre-school children: the role of eating behaviours. Int J Pediatr Obes. 2011; 6(2): 501-7.
25. Stunkard AJ, Berkowitz RI, Schoeller D, Maislin G, Stallings VA. Predictors of body size in the first 2 y of life: a high-risk study of human obesity. Int J Obes Relat Metab Disord. 2004;28(4):503-13.
26. van Jaarsveld CH, Llewellyn CH, Johnson L, Wardle J. Prospective associations between appetitive traits and weight gain in infancy. Am J Clin Nutr. 2011; 94(6):1562–7.
27. van Jaarsveld CH, Boniface D, Llewellyn CH, Wardle J. Appetite and growth: a longitudinal sibling analysis. JAMA Pediatr. 2014;168(4):345-50.
28. Victora CG, Bahl R, Barros AJ, França GV, Horton S, Krasevec J *et al*. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. Lancet. 2016; 387(10017): 475–90.
29. Webber L, Hill C, Saxton J, Van Jaarsveld CHM, Wardle J. Eating Behaviour and Weight in Children. Int J Obes (Lond). 2009. 33(1): 21–8.
30. WHO Multicentre Growth Reference Study Group. WHO Child Growth Standards based on length/height, weight and age. Acta Paediatr Suppl. 2006; 450: 76-85.
31. World Health Organization 2014. Global status report on noncommunicable diseases 2014. Switzerland. WHO Library Cataloguing. 2014;79-84.

32. World Health Organization 2016. Report of the Commission on Ending Childhood Obesity. Switzerland. WHO Library Cataloguing. 2016.
33. Yang Z, Huffman SL. Nutrition in pregnancy and early childhood and associations with obesity in developing countries. Matern Child Nutr. 2013; 9(1): 105–19

3 CONCLUSÃO

As hipótesis formuladas não podem-ser aceitas no seu conjunto, já que não todas as caracteristicas do apetite foram relacionadas ao estado nutricional, apenas o domínio “Apetite geral” do BEBQ durante o aleitamento exclusivo foi associado positivamente ao estado nutricional. O apetite infantil durante o aleitamento pode sugerir a condição do estado nutricional na primeira infância. Observações longitudinais empregando o BEBQ são necessárias para confirmar estes achados em idades precoces.

As mães consideraram que as crianças apresentaram bom apetite, gostavam de mamar, tinham maior capacidade de resposta alimentar embora com baixa regulação da saciedade no período de aleitamento exclusivo.

Não houve associação das variáveis sociodemográficos e aleitamento exclusivo com o estado nutricional.

4 REFERÊNCIAS*

1. Agras WS, Kraemer HC, Berkowitz RI, Hammer LD. Influence of early feeding style on adiposity al 6 years of age. J Pediatr.1990;116(5):805-9.
2. Barkeling B, Ekman S, Rossner S. Eating behavior in obese and normal weight 11-year-old children. Int J Obes Relat Metab Disord. 1992;16(5): 355–60.
3. Carnell S, Wardle J. Appetitive traits and child obesity: measurement, origins and implications for intervention. Proc Nutr Soc. 2008; 67(4):343-55.
4. Carnell S, Wardle J. Appetite and adiposity in children: evidence for a behavioral susceptibility theory of obesity. Am J Clin Nutr. 2008; 88(1): 22-9.
5. Dubois L, Farmer A, Girard M, Peterson K, Tatone-Tokuda F. Problem eating behaviors related to social factors and body weight in preschool children: A longitudinal study. Int J Behav Nutr Phys Act. 2007;4(4): 1-10.
6. Gallant AR, Tremblay A, Pérusse L, Bouchard C, Després JP, Drapeau V. The Three-Factor Eating Questionnaire and BMI in adolescents: results from the Québec Family Study. Br J Nutr. 2010;104(7):1074-9.
7. Jensen SM, Ritz C, Ejlerskov KT, Mølgaard C, Michaelsen KF. Infant BMI peak, breastfeeding, and body composition at age 3 y. Am J Clin Nutr. 2015;101(2):319-25.
8. Johannsen DL, Johannsen NM, Specker BL. Influence of parents' eating behaviors and child feeding practices on children's weight status. Obesity (Silver Spring). 2006;14(3):431–9.
9. Li R, Fein SB, Grummer-Strawn LM. Association of Breastfeeding Intensity and Bottle-Emptying Behaviors at Early Infancy With Infants' Risk for Excess Weight at Late Infancy. Pediatrics. 2008;122(2): 77-84.
10. Livingstone MB, Robson PJ. Measurement of dietary intake in children. Proc Nutr Soc. 2000; 59(2):279-93.
11. Llewellyn CH, van Jaarsveld CH, Johnson L, Carnell S, Wardle J. Development and factor structure of the Baby Eating Behaviour Questionnaire in the Gemini birth cohort. Appetite. 2011;57(2):388-96.

*De acordo com as normas da UNICAMP/FOP, baseadas na padronização do International Committee of Medical Journal Editors - Vancouver Group. Abreviatura dos periódicos em conformidade com o PubMed.

12. Quah PL, Chan YH, Aris IM, Pang WW, Toh JY, Tint MT et al. Prospective associations of appetitive traits at 3 and 12 months of age with body mass index and weight gain in the first 2 years of life. BMC Pediatr. 2015; 12(15):1-10.
13. Saldiva SR, Venancio SI, de Santana AC, da Silva Castro AL, Escuder MM, Giugliani ER. The consumption of unhealthy foods by Brazilian children is influenced by their mother's educational level. Nutr J. 2014;3:13-33.
14. Scaglioni S, Arrizza Ch, Vecchi F, Tedeschi S. Determinants of children's eating behavior. Am J Clin Nutr. 2011;94(6):2006–11.
15. Sleddens EF, Kremers SP, Thijs C. The Children's Eating Behaviour Questionnaire: factorial validity and association with Body Mass Index in Dutch children aged 6–7. Int J Behav Nutr Phys Act. 2008;20(5):1-9.
16. Spence JC, Carson V, Casey L, Boule N. Examining behavioural susceptibility to obesity among Canadian pre-school children: the role of eating behaviours. Int J Pediatr Obes. 2011;6(2): 501-7.
17. Stunkard AJ, Berkowitz RI, Schoeller D, Maislin G, Stallings VA. Predictors of body size in the first 2 y of life: a high-risk study of human obesity. Int J Obes Relat Metab Disord. 2004;28(4):503-13.
18. van Jaarsveld CH, Llewellyn CH, Johnson L, Wardle J. Prospective associations between appetitive traits and weight gain in infancy. Am J Clin Nutr. 2011; 94(6):1562–7.
19. Victora CG, Bahl R, Barros AJ, França GV, Horton S, Krasevec J et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. Lancet. 2016; 387(10017): 475–90.
20. Webber L, Hill C, Saxton J, Van Jaarsveld CH, Wardle J. Eating Behaviour and Weight in Children. Int J Obes (Lond). 2009 ; 33(1): 21–8.
21. World Health Organization 2014. Global status report on noncommunicable diseases 2014. Switzerland.WHO Library Cataloguing. 2014;79-84.

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*De acordo com as normas da UNICAMP/FOP, baseadas na padronização do International Committee of Medical Journal Editors - Vancouver Group. Abreviatura dos periódicos em conformidade com o PubMed.

22. World Health Organization 2016. Report of the Commission on Ending Childhood Obesity. Switzerland. WHO Library Cataloguing. 2016; 1-50.
23. Yang Z, Huffman SL. Nutrition in pregnancy and early childhood and associations with obesity in developing countries. Matern Child Nutr. 2013; 9(1): 105–19.

*De acordo com as normas da UNICAMP/FOP, baseadas na padronização do International Committee of Medical Journal Editors - Vancouver Group. Abreviatura dos periódicos em conformidade com o PubMed.

5 APÊNDICES

APÊNDICE 1: Ficha Clínica

FICHA CLÍNICA

Nº DO VOLUNTÁRIO: _____ **DATA**___/___/____

ESCOLA: _____

SALA_____ **INTEGRAL❑ PARCIAL❑ MANHÃ ❑** TARDE ❑

1. IDENTIFICAÇÃO E DADOS SOCIOECONOMICOS

Nome da criança_____Apelido_____

Data de nascimento _____/_____/_____Idade_____meses. Sexo:( )M ( )F

Endereço_____

Telefone_____

Nome do Pai _____Idade _____anos

Grau de instrução: ❑ sem escolaridade ❑ fundamental ❑ médio ❑ superior

Profissão_____Fone_____

Nome da Mãe _____Idade_____anos

Grau de instrução: ❑ sem escolaridade ❑ fundamental ❑ médio ❑ superior

Profissão_____Fone_____

Tem outros Irmãos ( )Não ( )Sim Quantos?____

Qual è a ordem da criança na familia? ( )Primogênito ( )Meio ( )Caçula ( )Outros:_____

Renda familiar (salário mínimos) _____

Criança mora com: ( ) Mãe e Pai ( )Mãe ( )Pai ( )Outros:_____

A família pratica exercícios físicos? ( )Não ( )Sim.Qual? _____

Possuem automóvel ?_____

Tem Plano de saúde?_____

2. HISTÓRIA PRÉ-NATAL

A mãe teve alguma alteração durante a gravidez? ( )Não ( )Sim. Qual?_____

A mãe utilizou algum remédio na gravidez? ( )Não ( )Sim.Qual? _____

A mãe fumou durante a gravidez? ( )Não ( )Sim

A mãe utilizou flúor durante a gravidez? ( )Não ( )Sim.Qual? _____

A mãe teve orientação odontológica durante a gravidez? ( )Não ( )Sim

Idade em que a mãe engravidou:_____

A mãe trabalhou na gravidez? ( ) Sim ( )não

A mãe trabalhou até que mês da gravidez ou semanas da gravidez? _____

Foi amamentado no peito? ( ) Sim ( )não , se sim quanto tempo? _____

3. HISTÓRIA NATAL

PARTO - Normal ❑ Fórceps ❑ Cesariana ❑

Complicações durante o parto _____

_____

NASCIMENTO Gestação durou quantas semanas_____

a termo ❑ prematuro ❑

Qual foi o peso ao nascer?_____

4. HISTÓRIA NEO-NATAL

PROBLEMAS DURANTE O 1º MÊS DE VIDA

❑ Icterícia ❑ Dificuldades respiratórias

❑ Febre alta ❑ Dificuldades de alimentação

❑ Doenças graves ❑ Dentes do nascimento ao 1º mês

Comentários _____

_____

5. HISTÓRIA PÓS-NATAL

DOENÇAS SISTÊMICAS

❑ **alergia**_____

❑ rinite alérgica_____

❑ sinusite _____

❑ amigdalites _____

❑ verminose _____

❑ **anemia**_____

❑ diabete_____

❑ **problemas renais**_____

❑ **discrasias sanguíneas** _____

❑ **problemas cardíacos** _____

❑ febre reumática_____

❑ **hepatite** _____

❑ **asma** _____

❑ outros_____

DOENÇAS DA INFÂNCIA (época)_____

❑ catapora

❑ rubéola

❑ sarampo

❑ caxumba,

❑ coqueluche

❑ resfriados frequentes

Estado de saúde atual da criança: _____

Data do último exame médico da criança: _____

A criança está em tratamento médico ? _____

Está tomando algum medicamento? ( )Não ( )Sim. Qual? _____

Medicamentos tomados pela criança no passado: _____

Vacinas estão ao dia ?: ( )Não ( )Sim

HOSPITALIZAÇÃO; ( ) Não ( )Sim
se sim especificar:_____
_____

6. HABITOS ALIMENTARES OU DE DIETA DA CRIANÇA

AMAMENTAÇÃO:

Mamou no peito nos primeiros meses de vida? ( )Sim ( )Não . Se **NÃO** especificar porquê?

_____

Quantos meses tinha seu filho quando deixou de mamar no peito?_____

Atualmente segue mamando no peito? ( )Sim ( )Não

Se deixou de mamar, Como ocorreu o desmame? Seu filho(a) aceitou facilmente? Chorava muito? _____

_____

Quando começou a comer mingaus, purês, papinhas, frutas, sopas, legumes,? Quantos meses tinha? _____

Nos primeiros meses de vida, a criança tomou unicamente leite no peito: desde _____até_____ meses

Seu filho(a) mamava no peito: ( ) de dia ( )de noite ( )de dia e de noite

ALEITAMENTO ARTIFICIAL

Tomou leite na mamadeira: ( ) sim ( )não
Quantos meses tinha seu filho (a) quando começou tomar mamadeira? _____

Atualmente toma leite na mamadeira? ( ) sim ( )não; Se **NÂO**, Quantos meses tinha seu filho quando deixou de tomar mamadeira?_____

Aumentou o furo da mamadeira? : ( ) sim ( ) não. Se **SIM**, especificar Porquê?
_____

Tomava a leite da mamadeira : Divagar ☐ Rápido ☐ Normal ☐
Qual foi o número de mamadeiras que tomava por dia?_____

ALIMENTAÇÃO COM LEITE DE FÓRMULA

Usou fórmula? Sim ( ) não ( ) ; se **SIM** porque?_____

Desde que idade tomou fórmula?_____meses,

Até que idade tomou fórmula? _____meses

ALIMENTAÇÃO ATUAL

Atualmente toma mamadeira? ( ) Sim ( )Não

Se **NÃO** toma mamadeira, bebe leite em: ( ) Copo ( )Outros _____especificar

Tipo de leite: vaca ☐ soja ☐ fórmula ☐

Usa o que para adoçar: adoçante ☐ açúcar ☐ mel ☐ Toddy ou Nescau ☐ outros:

Aumenta o furo da mamadeira? ( ) Sim ( )Não , se SIM Porque?_____

Número de mamadeiras que toma: Quantas de manhã? _____Quantas de tarde? _____ Quantas de noite? _____

Bebe o leite da mamadeira: rápido ( ) devagar ( ) normal ( )

Bebe outros líquidos em: mamadeira ☐ copo ☐ ambos ☐

Considera a alimentação de seu filho equilibrada: sim **( )** não( )

Como é o apetite da criança: normal ☐ tem bastante apetite ☐ tem pouco apetite ☐

Preferência de alimentos: líquidos ☐ pastosos ☐ semi-sólidos ☐ sólidos ☐ todos ☐

Preferência de alimentos: doçe ( ) salgado( )

6. HÁBITOS

			FREQUÊNCIA			
TIPO	***SIM***	***NÃO***	***DIA***	***NOITE***	***CONTÍNUO***	***ÀS VEZES***
Sucção de chupeta						
Sucção dos dedos						
Sução de paninho						
Sucção dos lábios						
Roer unhas						
Respira pela boca						
Interposição da língua						
Fonação anormal						

Se usou chupeta indique MARCA OU TIPO DE CHUPETA_____

Se marcou SIM no tabela de cima indicar: INÍCIO DO HÁBITO_____PAROU DE TER O HÁBITO _____

A) Hábitos físicos:

A familia pratica exercícios físicos SIM ❑ NÃO ❑ Quais? _____

A criança pratica exercícios físicos SIM ❑ NÃO ❑ Quais? _____

A familia tem o hábito de: Assistir TV SEMPRE ❑ ÀS VEZES ❑ NUNCA ❑

Jogar vídeo game SEMPRE ❑ ÀS VEZES ❑ NUNCA ❑

Usar computador SEMPRE ❑ ÀS VEZES ❑ NUNCA ❑

A criança tem o hábito de:	Assistir TV	SEMPRE ❑	ÀS VEZES ❑	NUNCA ❑
	Jogar vídeo game	SEMPRE ❑	ÀS VEZES ❑	NUNCA ❑
	Usar computador	SEMPRE ❑	ÀS VEZES ❑	NUNCA ❑
	Usar celular	SEMPRE ❑	ÀS VEZES ❑	NUNCA ❑

A criança quanto tempo gasta com TV ou jogos de vídeo game ou no celular por dia?

_____

APÊNDICE 02: Resultados adicionais não mostrados

Tabela 1. Voluntários com algum nível de incompreensão do pre-teste

Voluntário	Idade da criança	Sexo	Pergunta- não entendi (BEBQ)
A	20 meses	♀	17,18
B	31 meses	♂	12,16
C	32 meses	♂	13

Tabela 2. Associação das características apetitivas e estado nutricional

Características apetitivas e estado nutricional	p	rs
Prazer em comer	0.99	0
Resposta ao alimento	0.08	0.12
Ingestão Lenta	0.2	-0.09
Resposta à saciedade	0.88	-0.01
Apetite Geral	0.025	0.16

* Correlação significativa p≤ 0.05; rs: Coeficiente de Correlação de Spearman

Tabela 3. Associação das características sociodemográficos com o estado nutricional

	Valor de P	OR	IC 95%
Ensino fundamental Mãe	0,327	0,564	018 a 1,77
Primogênito	0.081	0,545	0,28 a 1,08
Alimentação equilibrada	0,151	2,571	0,71 a 9,31
Apetite atual	0,1359	1,730	0,84 a 3,56

Regressão logística múltipla (P = 0.033).

Tabela 4. Comparação entre os escores e domínios do BEBQ (teste *t* independente)

Meninos com meninas	*P* > 0,05
Crianças eutróficas com crianças com risco de sobrepeso, com risco de obesidade e obesas	*P* > 0,05
Crianças amamentadas exclusivamente até 5 meses com as amamentadas exclusivamente por menos de 5 meses	*P* > 0,05

6 ANEXOS

Anexo 01: Questionário do comportamento alimentar do bebê (BEBQ). Pré-teste.

NOME DO FILHO (A): **BERÇARIO:** **MATERNAL:**
ESCOLA: **DATA:**

Questionário do comportamento alimentar do bebê (BEBQ)

Estas perguntas são sobre o apetite do seu bebê durante os seus primeiros meses de vida. Estamos especificamente interessados a respeito do período no qual o seu bebê era alimentado apenas com leite materno ou fórmula, ou seja, antes de receber qualquer tipo de alimento sólido ou alimentos de bebê pré-preparados.

Como você descreveria o estilo alimentar de seu bebê durante um dia típico?

	Nunca	Raramente	Às vezes	Frequentemente	Sempre	Não entendi
1. Meu bebê parecia satisfeito enquanto tomava leite.	☐	☐	☐	☐	☐	☐
2. Meu bebê frequentemente queria mais leite do que eu oferecia.	☐	☐	☐	☐	☐	☐
3. Meu bebê adorava tomar leite.	☐	☐	☐	☐	☐	☐
4. Meu bebê tinha bastante apetite.	☐	☐	☐	☐	☐	☐
5. Meu bebê terminava de mamar rapidamente.	☐	☐	☐	☐	☐	☐
6. Meu bebê ficava angustiado enquanto tomava leite.	☐	☐	☐	☐	☐	☐
7. Meu bebê ficava saciado (cheio) facilmente.	☐	☐	☐	☐	☐	☐
8. Se lhe fosse permitido, meu bebê tomaria leite demais.	☐	☐	☐	☐	☐	☐
9. Meu bebê levava mais de 30 minutos para terminar de mamar.	☐	☐	☐	☐	☐	☐
10. Meu bebê ficava satisfeito antes de tomar todo o leite que eu achava que ele(a) deveria tomar.	☐	☐	☐	☐	☐	☐
11. Meu bebê mamava devagar.	☐	☐	☐	☐	☐	☐
12. Mesmo quando meu bebê tinha acabado de mamar bem, ele(a) ficava feliz de tomar leite novamente se fosse oferecido.	☐	☐	☐	☐	☐	☐
13. Meu bebê tinha dificuldade em realizar uma refeição completa.	☐	☐	☐	☐	☐	☐
14. Meu bebê estava sempre exigindo ser alimentado.	☐	☐	☐	☐	☐	☐
15. Meu bebê sugava cada vez mais devagar ao longo de uma refeição.	☐	☐	☐	☐	☐	☐
16. Se lhe fosse dada a oportunidade, meu bebê estaria sempre tomando leite.	☐	☐	☐	☐	☐	☐
17. Meu bebê gostava da hora de mamar.	☐	☐	☐	☐	☐	☐
18. Meu bebê podia facilmente tomar leite 30 minutos após a última mamada.	☐	☐	☐	☐	☐	☐

Anexo 02: Questionário do comportamento alimentar do bebê (BEBQ). Teste e Teste-reteste.

NOME DO FILHO(A): **SALA:**

ESCOLA: **DATA:**

Questionário sobre comportamento alimentar de bebês (BEBQ)

Estas perguntas são sobre o apetite do seu bebê durante os seus primeiros meses de vida. Estamos especificamente interessados a respeito do período no qual o seu bebê era alimentado apenas com leite materno ou fórmula, ou seja, antes de receber qualquer tipo de alimento sólido ou alimentos de bebê pré-preparados.

Como você descreveria o estilo alimentar de seu bebê durante um dia típico?

	Nunca	Raramente	Às vezes	Frequentemente	Sempre
1) **Meu bebê parecia satisfeito enquanto tomava leite.**	☐	☐	☐	☐	☐
2) **Meu bebê frequentemente queria mais leite do que eu oferecia.**	☐	☐	☐	☐	☐
3) **Meu bebê adorava tomar leite.**	☐	☐	☐	☐	☐
4) **Meu bebê tinha bastante apetite.**	☐	☐	☐	☐	☐
5) **Meu bebê terminava de mamar rapidamente.**	☐	☐	☐	☐	☐
6) **Meu bebê ficava angustiado enquanto tomava leite.**	☐	☐	☐	☐	☐
7) **Meu bebê ficava saciado (cheio) facilmente.**	☐	☐	☐	☐	☐
8) **Se lhe fosse permitido, meu bebê tomaria leite demais.**	☐	☐	☐	☐	☐
9) **Meu bebê levava mais de 30 minutos para terminar de mamar.**	☐	☐	☐	☐	☐
10) **Meu bebê ficava satisfeito antes de tomar todo o leite que eu achava que ele(a) deveria tomar.**	☐	☐	☐	☐	☐
11) **Meu bebê mamava devagar.**	☐	☐	☐	☐	☐
12) **Mesmo quando meu bebê tinha acabado de mamar bem, ele(a) ficava feliz de tomar leite novamente se**	☐	☐	☐	☐	☐

fosse oferecido.					
13) **Meu bebê tinha dificuldade em realizar uma refeição completa.**	☐	☐	☐	☐	☐
14) **Meu bebê estava sempre exigindo ser alimentado.**	☐	☐	☐	☐	☐
15) **Meu bebê sugava cada vez mais devagar ao longo de uma refeição.**	☐	☐	☐	☐	☐
16) **Se lhe fosse dada a oportunidade, meu bebê estaria sempre tomando leite.**	☐	☐	☐	☐	☐
17) **Meu bebê gostava da hora de mamar.**	☐	☐	☐	☐	☐
18) **Meu bebê podia facilmente tomar leite 30 minutos após a última mamada.**	☐	☐	☐	☐	☐

Anexo 03: Certificado do Comitê de Ética em Pesquisa com Humanos

COMITÊ DE ÉTICA EM PESQUISA
FACULDADE DE ODONTOLOGIA DE PIRACICABA
UNIVERSIDADE ESTADUAL DE CAMPINAS

CERTIFICADO

O Comitê de Ética em Pesquisa da FOP-UNICAMP certifica que o projeto de pesquisa "**Comportamento alimentar, condições orais e desenvolvimento da oclusão decídua em crianças na primeira infância**", protocolo nº **011/2015**, dos pesquisadores **MARIA BEATRIZ DUARTE GAVIÃO, EMANUELLA MEIRA PASCHOALETO, ROSA LUZ ABUHADBA MOSCOSO e GABRIELA DE PAULA SILVA**, satisfaz as exigências do Conselho Nacional de Saúde – Ministério da Saúde para as pesquisas em seres humanos e foi aprovado por este comitê em 27/05/2016.

The Ethics Committee in Research of the Piracicaba Dental School, University of Campinas, certify that the project "**Feeding behavior, oral conditions and development deciduous occlusion in children in early childhood**", register number **011/2015**, of **MARIA BEATRIZ DUARTE GAVIÃO, EMANUELLA MEIRA PASCHOALETO, ROSA LUZ ABUHADBA MOSCOSO and GABRIELA DE PAULA SILVA**, comply with the recommendations of the National Health Council – Ministry of Health of Brazil for research in human subjects and therefore was approved by this committee on May 27, 2016.

Prof. Jacks Jorge Junior

Coordenador
CEP/FOP/UNICAMP