BREASTFEEDING, COMPLEMENTARY FEEDING AND HEALTH

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Paula Chuproski Saldan [1]
Débora Falleiros de Mello[2]

[1] Universidade Estadual do Centro-Oeste, Departamento de Nutrição. Guarapuava, PR, Brasil.

[2] Universidade de São Paulo, Escola de Enfermagem, Departamento de Enfermagem Materno Infantil e Saúde Pública. Ribeirão Preto, SP, Brasil.

Correspondence
Paula Chuproski Saldan
pchuproski@unicentro.br

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Variables associated with the consumption of unhealthy foods by children aged from 6 to 23 months in a city in the countryside of Paraná State, Brazil

Variáveis associadas ao consumo de alimentos não saudáveis por crianças de 6 a 23 meses de idade de uma cidade do interior do Paraná

Abstract

Objective: To verify the variables associated with unhealthy food consumption by children aged 6-23 months. *Methods:* A cross-sectional study conducted during the Brazilian National Polio Vaccination Campaign 2012 in the city of Guarapuava, state of Paraná. The companions of 1,355 children answered the structured questionnaire on child feeding the day before the interview. Based on Step 8 of Dez passos para uma alimentação saudável - Guia alimentar para crianças menores de dois anos" (freely translated as Ten Steps to Healthy Eating A Food Guide for Children Under Two), we investigated the consumption of 10 unhealthy foods and adopted the F statistic to verify differences in the proportion of food intake, according to socioeconomic variables. *Results:* Children born to teenage mothers (≤19 years old), when compared to adult mothers (20 to 34 years old and ≥ 35 years old), had significantly higher consumption of filled wafers (40.9%, 28.5% and 22.1%), snacks (41.4%, 31.2% and 21.4%) and sweetened food (78%, 70% and 65.4%). Children born to mothers with low maternal schooling (<8 years), when compared to other levels of schooling (8-11 years and>

11 years), had higher consumption of snacks (42%, 31.2% and 11. 3%), sweets (60.2%, 53.9% and 37.4%) and sweetened food (75.2%, 70.6% and 61.4%). Among children born to mothers who attended the public health service compared to those who attended the private health service, the consumption of filled wafers (32.7% vs 21.3%) and snacks (37.2% vs 19.8%), coffee (41.9% vs 28.1%) and sweetened food (72.6% vs 66.2%). Rural-dwelling children, when compared to urban ones, showed higher consumption of processed juice (49.5% vs 42.5%), snacks (39.6% vs 30.4%), sweets (68.2 % vs 52.1%), coffee (46.6% vs 36.2%) and sweetened food (80% vs 69.5%). *Conclusion:* Consumption of unhealthy food was higher among children of teenage mothers with low schooling, public health service users and rural residents.

Keywords: Food Consumption. Industrialized Foods. Food Guide.Infant.

Resumo

Objetivo: Verificar variáveis associadas ao consumo de alimentos não saudáveis por crianças de 6-23 meses. *Métodos:* Estudo transversal realizado durante Campanha Nacional de Vacinação contra Poliomielite 2012 em Guarapuava-PR. Os acompanhantes de 1.355 crianças responderam ao questionário estruturado sobre alimentação da criança no dia anterior à entrevista. Com base no Passo 8 dos "Dez passos para uma alimentação saudável - Guia alimentar para crianças menores de dois anos", investigou-se o consumo de 10 alimentos não saudáveis e adotou-se a estatística F para verificar diferenças na proporção de consumo dos alimentos segundo variáveis socioeconômicas. *Resultados:* Crianças filhas de mães adolescentes (≤19 anos), quando comparadas às de mães adultas (20 a 34 anos e ≥ 35 anos), apresentaram consumo significativamente maior de bolacha recheada (40,9%, 28,5% e 22,1%), salgadinhos de pacote (41,4%, 31,2% e 21,4%) e alimento adoçado (78%, 70% e 65,4%), respectivamente. Crianças filhas de mães de baixa escolaridade materna (< 8 anos), quando comparadas aos demais níveis de escolaridade (8-11 anos e > 11 anos), apresentaram maior consumo de salgadinhos de pacote (42%, 31,2% e 11,3%), guloseimas (60,2%, 53,9% e 37,4%) e alimento adoçado (75,2%, 70,6% e 61,4%). Entre crianças filhas de mães que frequentaram o serviço público de saúde comparadas com as que frequentaram o serviço privado/convênio, foi maior o consumo de bolacha recheada (32,7% vs 21,3%), de salgadinhos de pacote (37,2% vs 19,8%), de café

(41,9% vs 28,1%) e de alimento adoçado (72,6% vs 66,2%), respectivamente. Em crianças moradoras da área rural, quando comparadas à urbana, evidenciou-se maior consumo de suco industrializado (49,5% vs 42,5%), salgadinhos de pacote (39,6% vs 30,4%), guloseimas (68,2% vs 52,1%), café (46,6% vs 36,2%) e alimento adoçado (80% vs 69,5%). *Conclusão:* O consumo de alimentos não saudáveis foi maior entre crianças de mães adolescentes, com baixa escolaridade, frequentadoras do serviço público de saúde e residentes da área rural.

Palavras-chave: Consumo de Alimentos. Alimentos Industrializados. Guias Alimentares. Lactente.

INTRODUCTION

Complementary feeding is defined as a process that begins when breast milk alone is not sufficient to meet the nutritional needs of infants. Thus, other foods and liquids are offered along with breast milk. The age group of six to 24 months is taken as a reference for this process, although the recommendation of breastfeeding exceeds two years of life of the child.[1]

Early feeding plays a major role, because it is during this phase that the child's eating habits are formed and established, with implications throughout their existence. Exposure to various healthy foods at this stage will influence dietary preferences in subsequent stages.[2]

Due to the wide variety of complementary foods present in children's diets in different parts of the world, it would not be appropriate to provide a global dietary prescription. Therefore, the World Health Organization (WHO) recommends that countries develop their own complementary feeding guidelines based on the nutritional composition of locally available foods.[1]

The Brazilian Ministry of Health, following the WHO recommendations for complementary feeding, the epidemiological profile and the food culture in the country, prepared in 2002 and revised in 2010 the document entitled "*Dez passos para uma alimentação saudável - Guia alimentar para crianças menores de dois anos*" (freely translated as Ten Steps to Healthy Eating – A Food Guide for Children Under Two). This document serves as a guide for the primary care health professional.[3] It is important to note that the aforementioned guide[4] has been under review since 2015, and in 2018 has been publicly consulted, pending final publication.[5]

The currently available guide emphasizes, in its Step 8, the following recommendation to "Avoid sugar, coffee, canned goods, fried foods, sodas, candies, snacks and other goodies in the early years of life. Use salt sparingly".[3] Following this line, the Food Guide for the Brazilian population in the Ten Steps to Adequate and Healthy Eating highlights, in Steps 3 and 4, the following recommendations to "Limit consumption of processed foods and avoid consumption of ultra-processed foods", respectively.[6] This is due to the fact that these foods are associated with increased childhood overweight and obesity, which may affect adulthood.[3,6]

The document entitled "*Orientações para avaliação de marcadores de consumo alimentar na atenção básica*" (freely translated as Guidelines for the assessment of food consumption markers in primary care) presents a form for assessing the diet of children aged six to 23 months that enables the calculation of four markers of unhealthy eating: consumption of hamburger and/or sausages, consumption of sweetened drinks, consumption of instant

noodles, snack foods or filled wafers and consumption of filled wafers, sweets or sweets, following the guidelines of the Food Guide for the Brazilian population.[7]

Studies assessing the eating habits of children under two years of age show early consumption of foods not recommended for this age group.[8-17] Some studies have analyzed the variables that interfere with this consumption, especially the area of residence, region of Brazil, maternal schooling, family income, maternal lifestyle, family habits, household characteristics, age and gender of the child.[11-19]

In this setting, this study aimed to verify the variables associated with the consumption of unhealthy food by children from six to 23 months of age in a city in the state of Paraná. The study followed Step 8 recommendation of "*Dez passos para uma alimentação saudável - Guia alimentar para crianças menores de dois anos*", providing subsidies for public policies related to infant feeding.

METHODS

This is a cross-sectional study conducted during the 2012 Brazilian National Polio Vaccination Campaign in Guarapuava, Paraná, Brazil. The study population was the group of children under two years old who attended the vaccination health centers in the urban and rural areas of the city. With information on the vaccinated population in the 2011 campaign, grouped into two age groups (<1 year and 1-5 years), the sample was stratified into the following age groups: children under 1 year and children 12-23 months. The groups constituted domains of study and, for each of them, a sample was drawn whose size met the precision requirements established. The number of children aged 12-23 months was estimated based on the population of children aged 1-5 years, assuming homogeneous distribution among age groups (1, 2, 3 and 4 full years). The sample size was estimated to enable analysis of indicators of breastfeeding and complementary feeding in different age groups. For children under one year of age, the prevalence of exclusive breastfeeding in children under six months was used, with a parameter of 40% between 2-3 months, according to a local study,[20] and a sampling error of 9%. For children aged 12-23 months, the "continuity of breastfeeding at one year" indicator was adopted (40%), considering the age group of 12-15 months and sampling error of 6%.

Sample size estimates were obtained by applying the algebraic expression of Lwanga and Lemeshow.[21] Subsequently, a 5% non-response adjustment and 1.4 outlining effect were obtained to compensate for the precision losses inherent in the cluster sample.[22] The final

sample size calculation for children under one year and 12-23 months was 1,005 and 1,129, respectively.

The study adopted cluster sampling with two-stage draw.[23] Considering that the children were not evenly distributed in the various vaccination health centers (conglomerates), a two-stage draw was applied, with probability proportional to the size of the conglomerates. In the first stage, the vaccination health centers were drawn according to the number of children vaccinated in 2011. In the second stage, systematically, the children in the vaccination queue were drawn in each health center. 32 vaccination health centers were drawn, and for each health center the estimated fraction of the draw needed to interview approximately 35 children under one year, and 38 from 12-23 months.

Data collection was performed from June 11 to 29, 2012, by 118 previously trained undergraduate students. The data collection tool was a questionnaire based on and modified from the one applied to the 2nd Survey on Breastfeeding Prevalence in Brazilian Capitals and Federal District (PPAM - II *Pesquisa de Prevalência de Aleitamento Materno nas Capitais Brasileiras e Distrito Federal*) in 2008.[22] The questionnaire included 67 questions regarding participant characteristics (mothers and children), health service use and closed questions (yes, no or not) about children's food intake the day before the interview.[24] Feeding was assessed through questions that addressed whether breast milk, water, teas, other types of milk, food groups, food consistency, unhealthy foods, or any other foods were consumed. The questions were applied to the companions of the children before vaccination.

Based on Step 8 of the document entitled Guide, which points out to "Avoid sugar, coffee, canned goods, fried foods, sodas, candies, snacks and other sweets in the first years of life. Use salt sparingly",[3] chose to choose ten foods to obtain unhealthy food indicators (1- wafer without filling, 2- filled wafer, 3-cheese *petit suisse*, 4 - soda, 5 - processed juice, 6 - snacks, 7 - sweets like candy, bubble gum, chocolate or ice cream, 8-coffee, 9 - Fried food, 10 - Food sweetened with sugar, brown sugar, sweetener, honey or cane molasses). Unhealthy food indicators were calculated for the proportion of children aged 6 to 23 months according to the variables analyzed.

The variables used in this study were: consumption of 10 unhealthy foods (consumed or not consumed); maternal age (≤19, 20-34 or ≥35 years); primiparity (yes or no); maternal schooling (<8, 8-11 or> 11 years of schooling); maternal work (yes or no); residing with the child's father (yes or no); area of residence (urban or rural); health service the child attends (public or private health network) and gender of the child (male or female). The variable "maternal schooling" was used as a proxy for family income.[25]

The analysis included calculating the proportions of the consumption of ten unhealthy foods by children and the variables analyzed. To identify the variables associated with the consumption of these foods, the F statistic was used, adopting a significance level of 5%. All estimates were calculated taking into account the design effect (survey module). Data analysis was performed using Stata software version 12.0 (Stata Corp., College Station, Texas, USA).

The study was approved by the Research Ethics Committee of the *Universidade de São Paulo* at *Escola de Enfermagem de Ribeirão Preto* (Opinion 34.613 of 06/11/2012). An informed consent waiver was requested, due to the application of a quick questionnaire in the vaccination line. The verbal consent of the companions was requested in order not to disturb the progress of the campaign. It is noteworthy that this procedure was adopted in the research of the project *Amamentação e Municípios do Instituto de Saúde da Secretaria de Saúde de São Paulo* (freely translated as Breastfeeding and Municipalities of the Health Institute of the Health Office of São Paulo) and II PPAM/Capitals and DF.[22,26]

RESULTS

Data were collected from 1,848 children, but 18 (1%) were excluded for not living in the city of Guarapuava and 16 (0.9%) due to age inconsistency or lack of information on date of birth. The number of refusals was 149 (8.1%), and the response rate was 90.8%. Of the total of children, 81.8% were accompanied by mothers and 18.2% by parents or grandparents. The characteristics of mothers and children are described in Table 1. To calculate the indicators of unhealthy food, children from six to 23 months were considered, totaling 1,355 children.

Table 1. Characteristics of children and mothers participating in the study in Guarapuava-PR, 2012 (n=1,335).

Characteristics	n	%
Age group of children (months)		
and ├ 12	476	35.1
12 ├ 18	490	36.1
18 ├ 24	389	28.7
Sex		
Female	706	52.1
Male	649	47.9
Type of delivery		
Vaginal	695	51.3
Cesarean	655	48.3
Not informed*	5	0.4

Table 1. Characteristics of children and mothers participating in the study in Guarapuava-PR, 2012 (n=1,335). (Continues)

Characteristics	n	%
Birth weight (grams)		
> 2,500	1,196	88.3
<2,500	131	9.7
Not informed*	28	2.1
Health service		
Public	877	64.7
Private	459	33.9
Not informed*	19	1.4
*Maternal parity***		
Primiparous	543	40.1
Multiparous	560	41.3
Not informed*	252	18.6
*Maternal age (years)***		
≤ 19	178	13.1
20-34	766	56.5
≥ 35	160	11.8
Not informed*	251	18.5
*Maternal schooling (years studying)***		
< 8	333	24.6
8-11	591	43.6
> 11	180	13.3
Not informed*	251	18.5
*Maternal work***		
No	743	54.8
Yes	361	26.6
Not informed*	251	18.5
*Living with the child's father***		
Yes	942	69.5
Not	161	11.9
Not informed *	252	18.6
Area of Residence		
Urban	1,230	90.8
Rural	125	9.2

* Data not answered by the child's companion.

**Data collected when the child's companion was the mother.

As can be seen from Table 2a, the consumption of wafers without filling was significantly higher among boys (77.5%) than in girls (73.2%). There was a decreasing trend in filled wafer consumption as the mother's age increased and maternal schooling increased. Filled wafer consumption was also significantly higher among children who did not live with their father compared with those who lived (36.1% vs 28.1%) and among those attending the public health

service when compared to private health service (32.7% vs 21.3%). The frequency of offering *petit suisse* cheese was significantly higher among primiparous mothers (45.1%) than among multiparous mothers (34.5%). The proportion of children who consumed soda was similar according to the categories of variables analyzed. The intake of processed juice was higher among the children living in the rural area of the city (49.5%) when compared to those in the urban area (42.5%).

Table 2a. Proportion of unhealthy food consumption (wafers without filling, filled wafers, *petit suisse* cheese, soda and processed juice) according to variables analyzed in children aged 6 to 23 months, Guarapuava-PR, 2012 (n=1,335).

Variables/Categories	% Wafers without filling	% Filled wafers	% *Petit suisse* cheese	% Soda	% Processed juice
Maternal age	p=0.1854	p=0.0019/0.0017*	p=0.1471	p=0.1349	p=0.3412
≤19 years	79.3	40.9	45.7	28.1	45.1
20-34 years	74.0	28.5	39.7	20.5	41.2
≥ 35 years	68.2	22.1	33.6	23.3	35.8
First child	p=0.0761	p=0.0500	p=0.0032	p=0.5060	p=0.2103
Yes	76.5	33.0	45.1	23.1	43.4
No	71.7	25.8	34.5	21.1	38.7
Maternal schooling	p=0.5896	p=0.0016/0.0074*	p=0.5769	p=0.0915	p=0.8406
< 8 years	72.5	31.8	39.1	27.3	42.1
8-11 years	74.0	31.6	41.0	19.1	40.7
>11 years	76.4	17.9	37.2	20.8	39.7
Maternal work	p=0.3354	p=0.0619	p=0.4244	p=0.2238	p=0.1796
Yes	72.5	24.6	37.6	19.2	37.7
No	74.7	31.6	40.7	23.4	42.6
Living with the child's father	p=0.9880	p=0.0325	p=0.5142	p=0.9791	p=0.8276
Yes	73.9	28.1	39.3	22.1	41.1
No	73.8	36.1	42.4	21.9	40.2
Area of residence	p=0.5199	p=0.2366	p=0.7594	p=0.6835	p=0.0065
Urban	75.5	29.0	42.1	22.5	42.5
Rural	71.6	31.7	40.0	24.3	49.5
Health service	p=0.5793	p=0.0001	p=0.2029	p=0.3078	p=0.1841
Public	74.8	32.7	43.2	23.5	44.4
Private	75.9	21.3	39.5	20.5	40.1
Child's sex	p=0.0233	p=0.0853	p=0.4264	p=0.1064	p=0.8791
Male	77.5	27.1	40.6	20.8	43.4
Female	73.2	31.1	43.1	24.3	42.9

*Statistically significant linear trend test.

The frequency of eating snack foods was higher among children of teenage mothers, compared to the age group ≥ 35 years (41.4% vs 21.4%). It was higher among children born to mothers with less than eight years of schooling, compared with schooling> 11 years old (42% vs 11.3%). Consumption was significantly higher among children born to mothers who did not

work outside the home (36.1%), compared to those who had work outside the home (21.5%); in the rural residents of the city (39.6%) when compared to the urban area (30.4%); and in those who attended the public health service (37.2%) compared to those who attended the private health service (19.8%). Analyzing the consumption of sweets and coffee, there was a higher trend of consumption among children of mothers with less schooling (60.2% and 47.2%), when compared to mothers with higher schooling (37.4% and 22.5%); residents of the rural area of the city (68.2% and 46.6%), when compared to the urban area (52.1% and 36.2%) and those attending the public health service (57.6% and 41.9%), compared to those attending the private service (45.8% and 28.1%) (Table 2b).

Table 2b. Proportion of consumption of unhealthy foods (snacks, sweets, coffee, fried food and sweetened food) according to variables analyzed in children aged 6 to 23 months, Guarapuava - PR, 2012 (n=1,335).

Variables/Categories	% Snacks	% Sweets	% Coffee	% Fried food	% Sweetened food
Maternal age	p=0.037/0.0049*	p=0.0619	p=0.6152	p=0.3753	p=0.0462/0.0122*
≤19 years	41.4	56.7	41.1	29.0	78.0
20-34 years	31.2	54.0	37.2	24.0	70.0
≥ 35 years	21.4	45.7	35.0	21.8	65.4
First child	p=0.7063	p=0.4734	p=0.2606	p=0.9353	p=0.6489
Yes	31.8	52.1	35.0	24.2	71.1
No	30.6	54.1	39.6	24.4	69.8
Maternal schooling	p<0.0001/0.0003*	p=0.0002/0.0028*	p=0.0003/0.0023*	p=0.1992	p=0.0210/0.0197*
< 8 years	42.0	60.2	47.2	28.0	75.2
8-11 years	31.2	53.9	36.6	23.5	70.6
>11 years	11.3	37.4	22.5	20.8	61.4
Maternal work	p=0.0008	p=0.1175	p=0.4459	p=0.2276	p=0.4783
Yes	21.5	48.6	35.4	21.3	69.0
No	36.1	55.6	38.5	26.0	71.3
Living with the child's father	p=0.2407	p=0.5643	p=0.6222	p=0.6304	p=0.2041
Yes	30.5	53.5	37.8	24.7	70.0
No	35.8	50.8	35.5	22.4	75.5
Area of residence	p=0.0004	p=0.0041	p=0.0070	p=0.7370	p=0.0028
Urban	30.4	52.1	36.2	24.8	69.5
Rural	39.6	68.2	46.6	22.8	80.0
Health service	p<0.0001	p=0.0045	p=0.0001	p=0.4310	p=0.0317
Public	37.2	57.6	41.9	25.5	72.6
Private	19.8	45.8	28.1	23.1	66.2
Child's sex	p=0.8248	p=0.3445	p=0.8972	p=0.5099	p=0.9608
Male	30.8	52.0	37.3	23.5	70.3
Female	31.6	54.8	36.9	25.5	70.4

* Statistically significant linear trend test.

The consumption of fried food among children did not differ between the analyzed variables. The consumption of sweetened foods was associated with the following variables: maternal age and schooling, area of residence and health service that the child attended. As

can be seen in Table 2b, children born to teenage mothers (78%) and less educated had a higher tendency to consume these foods (75.2%), when compared to mothers aged 35 and over (65.4%) and with more than 11 years of schooling (61.4%). Rural children also had a higher consumption of sweetened foods (80%) when compared to urban children (69.5%) and those who attended the public health network (72.6%), compared to the private service (66.2%).

DISCUSSION

This research made it possible to know the indicators of unhealthy food consumption by children aged 6 to 23 months and the variables associated with the consumption of these foods. The study assessed the consumption of unhealthy food on the day before the interview, which avoids memory bias and makes it possible to draw a profile of children's diet.[24] It is noteworthy that conducting surveys in vaccination campaigns has been used as a strategy to obtain information from populations in a short period of time and at low cost.[22,26,27] The external validity of the research can be assessed by the high coverage of the Polio Vaccination Campaign 2012 in Guarapuava, which reached 99%, and by the similar profile of the sample studied with data from the Live Birth Information System (SINASC - *Sistema de Informação de Nascidos Vivos*) 2012 for the city.[28,29] Of the children studied, 88.3% were born with adequate weight (≥ 2,500 grams) and 51.3% vaginal delivery versus 91.2% and 46.7% of the reference population.[29] Of the mothers interviewed, 24.6% had less than eight years of schooling and 11.8%, 35 years of age or older versus 28.7% and 11.1% of the reference population, respectively.[29]

The Food Guide in question does not differentiate foods by degree of processing as the Food Guide for the Brazilian population. However, it makes the caveat in its Step 8 which foods should be avoided by children in this age group.[3] Among the ten foods selected for this study, seven are classified as ultra-processed by the new food classification according to the Food Guide for the Brazilian Population,[6] namely: wafers without filling, filled wafers, *petit suisse* cheese, soda, processed juice, snacks and sweets (candy, chewing gum, chocolate, ice cream). Coffee, although not recommended for children under the age of two, is considered a fresh or minimally processed food. Fried foods should be avoided by excess fat, and sweetened foods are mostly considered culinary ingredients (sugar, brown sugar, honey, sugarcane molasses), except for the sweetener, which is considered an ultra-processed food.

Unfilled wafers without filling were more consumed by boys (77.5%) than girls (73.2%), and did not show differences in the frequency of consumption according to the other variables analyzed. The studies consulted showed a frequency of consumption of these foods ranging

from 29.9% to 79.3%, but do not differ the type of wafer without filling (with and without filling). Most of them analyzed the consumption of wafers without filling together with other foods (breads, cakes, snacks), which makes it difficult to compare the results.[9-13,16] Although the consumption of filled wafers was lower than that of wafers without filling between the categories of the analyzed variables, it was possible to verify the association of their consumption with more variables.

The variable maternal age was associated with the consumption of filled filled wafers, snack foods and sweetened foods. It was observed that children born to older mothers had a lower tendency to consume these foods. Maternal schooling was also associated with the same foods mentioned above, as well as with sweets and coffee, and a lower consumption trend was observed with the increased schooling of the mother of the child. In a study by Saldiva et al.,[12] which assessed the consumption of unhealthy foods (processed juice, sodas, coffee, wafers without filling/snacks and sugar and/or honey), in a sample of children under one year old who attended the vaccination, the consumption of these foods was higher among children of mothers with less schooling. Similar finding was obtained in a study that assessed the consumption of processed foods by children up to 24 months in the city of Maceió, state of Alagoas, 19 considering the foods contained in the "Food Guide for children under two years". Consumption was significantly higher among children whose mothers had lower levels of schooling and family income.[19]

Children born to primiparous mothers had a higher frequency of consumption of *petit suisse* cheese (45.1%) when compared to multiparous cheese (34.5%). A study that assessed the practices and food consumption of infants in three Brazilian metropolises reported that 51.3% of children aged 6 to 12 months ingested *petit suisse*, but there was no investigation of variables associated with the consumption of this food.[9] Normally this type of food is common in the universe of infant feeding practices and for many years has been in the media advertisements as a protein and calcium rich food intended for children.

Children who did not live with their father, compared to those who lived, had a higher frequency of filled wafer consumption; and those whose mothers did not work abroad had higher consumption of snack foods than those who went to work. Children who attended the public health service had higher consumption of filled wafers, snack foods, sweets, coffee and sweetened food than those who attended the private service. Although the household income was not investigated, it is believed that the children who attended the public health service were those from families with lower income. In all food consumption associations in which maternal schooling was assessed, higher consumption of unhealthy foods was observed

among children born to mothers with less schooling (less than 8 years of schooling). However, this data needs to be analyzed with caution. The child health segment in the public health service often offers actions to mothers and families with guidance and advice on food and nutrition that does not always exist in the private sphere.[30]

An example of an initiative in the Brazilian Unified Health System (SUS – *Sistema Único de Saúde*) is the Brazil Breastfeeding and Food Strategy. It was launched in 2012 as a result of the integration of two important actions of the Ministry of Health: the Brazilian Breastfeeding Network and the Brazilian National Strategy for Complementary Healthy Eating (ENPACS - *Estratégia Nacional para a Alimentação Complementar Saudável*). They came together to form this new strategy, which aims to qualify the work process of primary care professionals in order to reinforce and encourage the promotion of breastfeeding and healthy eating for children under two years of age within the SUS.[31] However, it is not enough to guide and advise mothers, guardians or caregivers of appropriate and unsuitable foods, as other factors influence the supply or consumption of unhealthy food by young children. The home environment and the fact that other family members eat foods considered inappropriate by children increases the chance of consumption.[17]

Data from the Household Budget Survey (POF (*Pesquisa de Orçamentos Familiares*) 2008-2009) show the presence of unhealthy consumption markers such as filled biscuits at home, followed by soda, sweets, pizza and processed snacks.[32] The importance of encouraging proper and healthy eating beyond the child, something to be achieved by the whole family, can help to decrease children's inappropriate food intake. According to the Food Guide for the Brazilian population,[6] the consumption of ultra-processed foods should be avoided and the base of the diet should be fresh or minimally processed foods.

It also needs to be emphasized that for moms and dads, the fact that they can offer some foods, even if considered "inappropriate" for their children, can represent an ideal of affirmation and status seeking that these foods can bring to the low income population.[33] Offering foods that are considered non-nutritious to children, such as sweets (sweets, filled wafers, sodas, snacks), pregnant women of diverse symbolic value, associated with the food universe of the most economically favored class, is a means for the poor to show to herself and to her peers she can also consume what is symbolically positive. Consumption of such foods also appears to be associated with the affective dimension, that is, offering what is not fundamental to food translates to parents and children as a sign of affection, even if this consumption means the deprivation of other goods.[34]

Qualitative study conducted from the participant observation of the feeding of malnourished children under two years in eight households in the city of the present study showed that processed foods were present in all visited houses. Sausages, canned, artificial color products, very salty, sweetened foods, sodas, filled wafers and mayonnaise were observed. Several of these foods were considered inadequate by mothers and should only be present in the food sporadically, however in the reports it was learned that the discourse was distinct from the practice.[35]

The proportion of children who consumed soda and fried food was around 20%, similar according to the categories of the variables analyzed. Studies that assessed the consumption of soda by children obtained lower and higher values than reported in this study. A study in the city of Acrelândia, state of Acre, found that only 4.2% of children aged six to 24 months ingested this drink.[10] A study that assessed the complementary feeding of children aged six to 24 months in the Primary Health Care Network of the city of Macaé, state of Rio de Janeiro, reported that the consumption of sodas increased with child age. They are 17.8% among children from six to 12 months; 50% between 12 and 18 months; and 55.5% between 18 and 24 months.[15] Data from the Brazilian National Health Survey, worked and analyzed by Jaime et al.,[16] indicate soda consumption in 32.3% of children under two years. Jaime, Prado and Malta[17] report that the consumption of sugary drinks (sodas or artificial juices) by children under two years old is influenced by the family environment. Consumption of sweetened drinks by adults, the habit of watching TV for more than three hours, older age and schooling and number of family members stand out.

Children living in the rural area of the city had higher consumption of processed juice (49.5%), snack foods (39.6%), sweets (68.2%), coffee (46.6%) and sweetened food (80%), when compared to urban residents (42.5%, 30.4%, 52.1%, 36.2% and 69.5%). These findings contrast with some studies that showed higher consumption of unhealthy food by children living in urban areas. Bortolini, Gubert & Santos[11] when analyzing the food consumption data of children aged 6 to 59 months participating in the Brazilian National Demographic and Health Survey (PNDS 2006), they found that the consumption of fried foods and snacks did not vary with the place of residence. Meanwhile, consumption of sweets, wafers without filling and sodas was higher among urban residents. Data from the POF 2008-2009 showed that the average daily per capita consumption in rural areas was higher for foods considered healthy. On the other hand, in the urban area, we highlight ready-to-eat or processed products, such as salt bread, filled wafers, yoghurts, vitamins, sandwiches, fried and baked snacks, pizzas, sodas and juices.[32] Jaime et al.[16] did not observe differences in the consumption of unhealthy food marker foods (soda or artificial juice and wafers without filling, filled wafers or cake)

between children under two years old living in urban or rural households. Jaime, Prado and Malta[17] reported that the consumption of sugary drinks (sodas or artificial juices) by children under two years old was higher in the South Region (38.7%) and lower in the Northeast Region (24.3%). There were no differences in the consumption of these beverages when comparing the urban and rural residence area. However, they pointed out that there was an increase in the consumption of these beverages among rural children assessed by PNDS in 2006 (9.7%) and by the Brazilian National Health Survey (32.2%) in 2013.

As limitations of the present study, we highlight the number of refusals to participate. No data were collected regarding these subjects, which does not allow us to trace their profile and assess the possibility of selection bias. Another limitation was the way children were assessed, i.e., through a structured questionnaire on food intake on the previous day, which may not reflect the children's normal diet. However, this is still the method recommended by WHO to assess the eating practices of children under two years old.

CONCLUSION

This study made it possible to know the variables associated with the consumption of unhealthy food among children aged six to 23 months. Maternal age and schooling, type of health service the child attended and area of residence were the main variables associated with the consumption of unhealthy food. Daughters of teenage mothers and children with less than eight years of schooling showed a higher tendency to eat filled wafers, snack foods and sweetened food when compared to daughters of more educated adult mothers. Low maternal schooling also influenced the consumption of sweets and coffee. Children who attended the public health service had higher consumption of filled wafers, snack foods, sweets, coffee and sweetened food, when compared to those who attended the private health service. Living in the rural area of the city showed higher consumption of processed juice, snack foods, sweets, coffee and sweetened food, when compared to the urban area. It showed that unhealthy foods are accessible to the entire population regardless of their place of residence.

The main associations found in this study highlight mainly social problems. The highest consumption of unhealthy foods was reported for children of teenage mothers, with low schooling and attending the public health service. These findings emphasize the need for public policies that address the importance of healthy eating in childhood, focusing on the family and the social problems faced by them that make healthy eating impossible.

REFERENCES

1. Pan American Health Organization, World Health Organization. Guiding principles for complementary feeding of the breastfed child. Washington, DC: PAHO; 2003.
2. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Saúde da criança: nutrição infantil: aleitamento materno e alimentação complementar. 2. ed. Brasília: Ministério da Saúde; 2015. 184 p. (Cadernos de Atenção Básica; n. 23).
3. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Dez passos para uma alimentação saudável: guia alimentar para crianças menores de dois anos: um guia para o profissional da saúde na atenção básica. 2. ed. Brasília: Ministério da Saúde; 2010. 68 p.
4. Ministério da Saúde. Organização Pan Americana de Saúde. Departamento de Atenção Básica. Guia alimentar para crianças menores de 2 anos. Brasília: Ministério da Saúde; 2002. 152 p. (Série A. Normas e Manuais Técnicos; n. 107).
5. Ministério da Saúde. Departamento de Atenção Básica. Coordenação Geral de Alimentação e Nutrição. Guia alimentar para crianças menores de dois: versão para consulta pública. Brasília: Ministério da Saúde; 2018. 163 p.
6. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Guia alimentar para a população brasileira. 2. ed. Brasília: Ministério da Saúde; 2014. 156 p.
7. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Orientações para avaliação de marcadores de consumo alimentar na atenção básica. Brasília: Ministério da Saúde; 2015. 33 p.
8. Bernardi JLD, Jordão RE, Filho AAB. Alimentação complementar de lactentes em uma cidade desenvolvida no contexto de um país em desenvolvimento. Rev Panam Salud Publica 2009;26(5):405-411.
9. Caetano MC, Ortiz TTO, Silva SGL, Souza FIS, Sarni ROS. Alimentação complementar: práticas inadequadas em lactentes. J. Pediatr. (Rio J.). 2010; 86(3):196-201. http://dx.doi.org/10.2223/JPED.1994
10. Garcia MT, Granado FS, Cardoso MA. Alimentação complementar e estado nutricional de crianças menores de dois anos atendidas no Programa Saúde da Família em Acrelândia, Acre, Amazônia Ocidental Brasileira. Cad. Saúde Pública 2011;27(2):305-316. http://dx.doi.org/10.1590/S0102-311X2011000200012
11. Bortolini GA, Gubert MB, Santos LMP. Consumo alimentar entre crianças brasileiras com idade de 6 a 59 meses. Cad. Saúde Pública 2012; 28(9):1759-1771. http://dx.doi.org/10.1590/S0102-311X2012000900014
12. Saldiva SR, Venancio SI, Santana AC, Castro ALS, Escuder MM, Giuliani ER. The consumption of unhealthy foods by Brazilian children is influenced by their mother's educational level. Nutr J. 2014; 13:33. http://dx.doi.org/10.1186/1475-2891-13-33

13. Gonçalves MRS, Cadete MMM. Aleitamento materno exclusivo e alimentação complementar entre menores de um ano em Ribeirão das Neves-MG. Demetra 2015; 10(1):173-187. http://dx.doi.org/10.12957/demetra.2015.13479
14. Coelho LC, Asakura L, Sachs A, Erbert I, Novaes CRLN, Gimeno SGA. Sistema de Vigilância Alimentar e Nutricional/SISVAN: conhecendo as práticas alimentares de crianças menores de 24 meses. Ciênc. Saúde Coletiva 2015; 20(3):727-738. http://dx.doi.org/10.1590/1413-81232015203.15952014
15. Marinho LMFO, Capelli JCS, Rocha CMM, Bouskela A, Carmo CN, Freitas SEAP et al. Situação da alimentação complementar de crianças entre 6 e 24 meses assistidas na Rede de Atenção Básica de Saúde de Macaé, RJ, Brasil. Ciênc. Saúde coletiva 2016; 21(3):977-986. http://dx.doi.org/10.1590/1413-81232015213.06532015
16. Jaime PC, Frias PG, Monteiro HOC, Almeida PVB, Malta DC. Assistência em saúde e alimentação não saudável em crianças menores de dois anos: dados da Pesquisa Nacional de Saúde, Brasil, 2013. Rev. Bras. Saúde Matern. Infant. 2016;16(2):159-167. http://dx.doi.org/10.1590/1806-93042016000200005
17. Jaime PC, Prado RR, Malta DC. Influência familiar no consumo de bebidas açucaradas em crianças menores de dois anos. Rev. Saúde Públ. 2017;51Supl 1:13s. https://doi.org/10.1590/S1518-8787.2017051000038
18. Souza RLV, Madruga SW, Gigante DP, Santos IS, Barros AJD, Assunção MCF. Padrões alimentares e fatores associados entre crianças de um a seis anos de um município do Sul do Brasil. Cad. Saúde Pública 2013; 29(12):2416-2426. http://dx.doi.org/10.1590/0102-311X00156412
19. Sotero AM, Cabral PC, Silva GAPS. Fatores socioeconômicos, culturais e demográficos maternos associados ao padrão alimentar de lactentes. Rev. Paul. Pediatr. 2015;33(4):445-452. http://dx.doi.org/10.1016/j.rpped.2015.03.006
20. Brecailo MK, Corso ACT, Almeida CCB, Schmitz BAS. Fatores associados ao aleitamento materno exclusivo em Guarapuava, Paraná. Rev. Nutr. 2010; 23(4):553-563. http://dx.doi.org/10.1590/S1415-52732010000400006
21. Lwanga SK, Lemeshow S. Sample size determination in health studies: a practical manual. Geneva: WHO; 1991.
22. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Ações Programáticas e Estratégicas. II Pesquisa de Prevalência de Aleitamento Materno nas capitais brasileiras e Distrito Federal. Brasília: Ministério da Saúde; 2009. 108 p. (Série C. Projetos, Programas e Relatórios).
23. Silva NN. Amostragem probabilística: um curso introdutório. São Paulo: EDUSP; 1998.
24. World Health Organization. Indicators for assessing infant and young child feeding practices: conclusions of a consensus meeting held 6-8 November 2007. Washington, DC: WHO, 2008.
25. Venancio SI, Escuder MML, Saldiva SRDM, Giugliani ERJ. A prática do aleitamento materno nas capitais brasileiras e Distrito Federal: situação atual e avanços. J. Pediatr. (Rio J.). 210;86(4):317-324. http://dx.doi.org/10.1590/S0021-75572010000400012.

26. Venancio SI, Escuder MML, Kitoko P, Rea MF, Monteiro CA. Frequência e determinantes do aleitamento materno em municípios do Estado de São Paulo. Rev. Saúde Públ. 2002;36(3):313-18. http://dx.doi.org/10.1590/S0034-89102002000300009.
27. Santos LM, Paes-Sousa R, Silva Junior JB, Victora CG. National Immunization Day: a strategy to monitor health and nutrition indicators. Bull World Health Organ. 2008; 86(6):474-479. http://dx.doi.org/10.2471/BLT.07.043638
28. Ministério da Saúde. Sistema de Informação do Programa Nacional de Imunizações. Campanha nacional de vacinação contra poliomielite 2012. [Acesso 22 ago. 2012]. Disponível em: http://pni.datasus.gov.br/consulta_polio_12_selecao.asp?enviar=ok&sel=vacinometro&faixa=todos&grupo=todos&uf=PR&municipio=410940
29. Ministério da Saúde. Informações de saúde. Nascidos vivos - Paraná. [Acesso 26 jun. 2019]. Disponível em: http://tabnet.datasus.gov.br/cgi/deftohtm.exe?sinasc/cnv/nvpr.def
30. Campos AAO, Cotta RMM, Oliveira JM, Santos AK, Araújo RMA. Aconselhamento nutricional de crianças menores de dois anos de idade: potencialidades e obstáculos como desafios estratégicos. Ciênc. Saúde Coletiva 2014; 19(2):529-538. http://dx.doi.org/10.1590/1413-81232014192.09642012
31. Ministério da Saúde. Portaria nº 1.920, de 5 de setembro de 2013. Institui a Estratégia Nacional para Promoção do Aleitamento Materno e Alimentação Complementar Saudável no Sistema Único de Saúde (SUS) – Estratégia Amamenta e Alimenta Brasil. Diário Oficial da União 06 set 2013; Seção 1.
32. Instituto Brasileiro de Geografia e Estatística. Pesquisa de Orçamentos Familiares 2008-2009: análise do consumo alimentar pessoal no Brasil. Rio de Janeiro: IBGE; 2011. 150 p.
33. Tonial SR. Desnutrição e obesidade: faces contraditórias na miséria e na abundância. Recife: Instituto Materno Infantil de Pernambuco; 2001. 189 p.
34. Romanelli G. O significado da alimentação na família: uma visão antropológica. Medicina 2006; 39(3):333-339.
35. Chuproski P, Tsupal PA, Furtado MCC, Mello DF. Práticas alimentares de crianças desnutridas menores de dois anos de idade. Rev. Gaúcha Enferm. 2012; 33(4):118-125. http://dx.doi.org/10.1590/S1983-14472012000400015

Contributors

Saldan PC participated in the study design, organization of data collection, analysis and interpretation, article writing, final review and approval of the manuscript for submission. de Mello DF participated in the study design, analysis and interpretation of data, writing of the article, final review and approval of the manuscript for submission.

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