

Food and Nutrition Surveillance System/SISVAN: getting to know the feeding habits of infants under 24 months of age

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Abstract *The objective of the Food and Nutrition Surveillance System (SISVAN) is to monitor the food intake of individuals attended by the Brazilian Unified Health System (SUS). The objective of this research was to identify the feeding practices of children under 24 months of age who were attended at Primary Healthcare Units (UBS), using SISVAN, and to assess the relationship with maternal sociodemographic profiles. A cross-sectional study was conducted in order to evaluate 350 children using the Food Consumption Marker Form of SISVAN, and maternal demographic data to identify sociodemographic profiles by exploratory factor analysis. Of the children assessed, 41.1% were under 6 months of age and 98.7% of those between 6 and 23 months had an inadequate intake. Two sociodemographic profiles were found: Profile 1 (mothers with lower income, less education, and recipients of the 'Bolsa Família' conditional family grant program) associated with the consumption of water/tea, cow's milk and salty baby food; and Profile 2 (older mothers with many children and with a larger number of residents in the household) associated with breast milk consumption ($p = 0.048$). The use of SISVAN made it possible to identify that children had inadequate feeding practices, and Profile 1 appears to be a risk profile for weaning.*

Key words *Nutritional surveillance, Breast-fed infant, Food consumption*

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Introduction

The National Food and Nutrition Policy (*Política Nacional de Alimentação e Nutrição*; PNAN 2012)¹ was instituted to improve the dietary, nutritional and health status of the Brazilian population. Food and nutrition surveillance, the third PNAN directive, involves the collection, analysis and interpretation of data to determine individuals' nutritional status and eating habits. Of special interest are children younger than 24 months, about whom data regarding the prevalence of breastfeeding (BF) and exclusive breastfeeding (EBF); the introduction of complementary feeding (CF); and diet quality, measured by the presence of fruits and vegetables, sodium, fats and simple sugars, are collected. The Food and Nutrition Surveillance System (*Sistema de Vigilância Alimentar e Nutricional*, SISVAN) was designed to monitor the nutritional status and food intake characteristics of individuals receiving care within the Public Health System (*Sistema Único de Saúde*, SUS)².

The nutritional status of children, especially those in the first years of life, is considered the primary indicator of the health of this population because it reveals the environmental conditions to which they are exposed, including diet, illness, housing and basic sanitation conditions. It is also known that the nutritional status of children may be affected by maternal age and education level, socioeconomic status and family structure³⁻⁵.

Improper eating habits or nutritional deficiencies may increase infant mortality rates because these factors have a direct and immediate impact on children's health and long-term consequences, including increased risk of chronic noncommunicable diseases⁶.

Thus, city managers should identify and address situations of nutritional risk; collect food consumption data; and combine, monitor and assess food and nutrition indicators. They should also provide information to the healthcare information systems⁷ to support the mission of PNAN 2012¹. To facilitate information sharing, SISVAN-Web, operated by the Primary Healthcare program (*Atenção Primária à Saúde*, APS), was created by the Brazilian Ministry of Health (*Ministério da Saúde*, MS) based on food intake indicators provided by the System itself⁸.

The MS advocates surveillance at both community and individual levels because long-term measures and immediate action are required at both levels to address existing issues². At a community level, some initiatives may take a longer

time to be implemented. At an individual level, however, they can be implemented almost immediately after identifying the issue because after the data are entered into the computer system, they can be analyzed and interpreted, and the exact location of the individual can be identified, facilitating the efforts of Family Health teams (*equipes de Saúde da Família*, eSF)².

The eSF are a component of the Family Health Strategy (*Estratégia de Saúde da Família*), which aims to reorganize the APS through expansion, training and consolidation. Its goal is to enhance the problem-solving capacity and improve the health status of individuals and communities through regional healthcare⁹.

Identifying regions based on epidemiological and nutritional indicators provides a greater awareness and understanding of individuals' social context, which can improve response to and resolution of identified issues¹⁰. In addition, the relationship between these indicators and maternal sociodemographic factors, which may lead to increased risk of health problems among the infant population, promotes rapid decision-making and prevention.

Therefore, the present study aimed to identify the eating habits of children younger than 24 months who were treated at Primary Healthcare Units (*Unidades Básicas de Saúde*, UBS). The SISVAN was used to assess the relationship of these habits to maternal sociodemographic profiles.

Methods

This cross-sectional study was conducted in six UBS in the city of Diadema, a municipality of the State of São Paulo (SP), between April and December 2012 in response to a request from the municipal Primary Healthcare Coordinator. Diadema has a land area of 30.840 km²; in 2010¹¹, census data indicated that the total population of the city was 386,089 inhabitants, with a population density of 12,519.10 inhabitants/km². The municipality has 20 UBS, including 96 eSF consisting of physicians, nurses, nursing technicians and assistants and community health agents (*Agentes Comunitários de Saúde*, ACS). The quarterly average number of children younger than two years monitored by the six UBS during the study period was 833, according to the Primary Healthcare Information System.

In this study, 350 children younger than 24 months who voluntarily sought treatment at a UBS or who were at the time of the data collec-

tion participants in the Family Allowance Program (*Programa Bolsa Família*, PBF) were analyzed. The children's mothers or guardians were informed about the study, and those who consented to have their child participate in the study freely signed the Informed Consent Form when the data were collected.

The data were collected by nutritionists, ACS and other duly trained eSF professionals.

Data on maternal socioeconomic and demographic variables (age, education level, family status, family income, PBF beneficiary status, number of living children, household size and housing conditions) and infant variables (gender, age and food intake) were collected. The data on food intake were collected using the Food Intake Markers for Children Younger Than Five Years form, available through SISVAN⁸ and SISVAN-Web and adapted by the author.

This form consists of questions about the surveyed child and is organized by age group: younger than six months, between six months and two years and between two years and five years.

The questions relevant to children younger than six months focus on breastfeeding practices and identify the type of complementary foods currently offered to the infant⁸. The questions designed for children between six months and two years gather data about the introduction of complementary feeding, identify the current type of feeding and assess the adoption of risk behaviors that lead to the development of iron-deficiency anemia and childhood obesity⁸. Most questions concerning both age groups refer to the day before the survey.

The recommendations outlined in "Ten steps to a healthy diet, 2nd edition"⁶ were used in each question to classify food intake as either adequate or inadequate for both age groups. Step 1 (strictly breastfeeding until 6 months of age, without providing water, teas or any other foods) was the standard for children younger than six months. Steps 2 (slowly and gradually introducing other foods while maintaining breastfeeding from six months to two years or older), 3 (offering complementary foods, such as cereals, tubers, meat, legumes, fruits and vegetables three times a day, if the child is breastfeeding, after six months) and 8 (avoiding sugar, coffee, canned or fried foods, soft drinks, candy, salty snacks and other treats in the early years of life and using salt sparingly) were the standard for children between six and 24 months. Supplement V, which provides guidance on "Specific weight control practices," was also referred to.

Exploratory factor analysis was used to identify the maternal sociodemographic profiles. A Kaiser-Meyer-Olkin (KMO) test was used to assess the applicability of this method¹²; the result was 0.52 (values close to 1 indicate a good fit). Two main factors were further analyzed because together, they accounted for 35% of the total data variability; *combined, the remaining factors accounted for only 14% of this variability*. Factor rotation (varimax orthogonal rotation) was performed to assess which factors were independent from each other. Scores were generated for each factor following the rotation. These scores represent the degree to which each factor differs from the average of each score (expressed as the standard deviation); higher scores indicate greater adherence to the profile.

Central tendency (mean) and dispersion (standard deviation) measures were used for quantitative variables and absolute and relative frequencies were used for qualitative variables in the data description. Chi-square and *Student's t* statistics were used, and the significance level was assumed to be equal to 5%. The sample size of the association analyses between the variables of interest varied according to the number of records with complete data.

The statistical software Stata (10.0) was used in the data analysis.

This study's authors declare no conflicts of interest. The study was approved by the Research Ethics Committee of the Federal University of São Paulo (*Comitê de Ética em Pesquisa da Universidade Federal de São Paulo*).

Results

Of the 350 children included in the study, 51.7% were girls. The mean age was 11.3 months (standard deviation = 7.1 months), and 68% were between the ages of six and 23 months. Regarding maternal characteristics, 66.3% of the mothers were between 20 and 35 years of age, 58.4% had attended high school (dropped out/graduated) and 71.4% lived with a partner. Furthermore, 57.3% of the mothers lived with as many as four people, and 73.4% had a family income equaling as much as two minimum wages; 58.2% were not PBF beneficiaries, and 35.1% had one living child.

Two socioeconomic profiles were found. One profile included mothers with lower incomes and lower education levels who were PBF beneficiaries (Profile 1). The other included older mothers

with more children and more household members (Profile 2).

The results of the survey showed that 56% of the children were being breastfed at the time of data collection. The prevalence of exclusive, predominant and complemented breastfeeding among children younger than six months ($n = 112$) was 41.1%, 9.8% and 30.4%, respectively. The prevalence of breastfeeding among children between six and 23 months old was 44.4%.

The results also showed that 58.0% of all children younger than six months had inadequate nutrition intake for their age, and the most frequently consumed foods were water or tea (58.6%), infant formula (49.2%), cow's milk (25%) and fruit juice (19%). Table 1 shows the

food intake the day before the data collection of all surveyed children younger than six months.

Among the children between six and 23 months old, 98.7% had inadequate diets, according to the guidelines for this age group. Among the children whose food intake was inadequate, the following items showed the highest frequency of inadequate levels: intake of juice or industrialized soft drinks in the last month (60.8%), no breastfeeding during the previous day (56.9%), intake of porridge with milk or milk with thickener during the previous day (54.3%), intake of soft drink in the last month (54.2%), intake of salty porridge before six months of age (45.2%), having completed a meal watching TV (33.3%) and eating sugar before six months of age (32.4%).

Table 1. Number and percentage of children younger than six months by gender and dietary intake on the previous day. Diadema/SP, 2012.

Variable	Gender				Total		p
	Female		Male		n	%	
	n	%	n	%			
Breastfeeding							0.525
Yes	45	83.3	44	78.6	88	80.9	
No	9	16.7	12	21.4	21	19.1	
Total	54	100	56	100	110	100	
Water/tea							0.484
Yes	19	35.9	15	29.4	34	32.7	
No	34	64.1	36	70.6	70	67.3	
Total	53	100	51	100	104	100	
Cow's milk							0.842
Yes	8	14.8	7	13.5	15	14.2	
No	46	85.2	45	86.5	91	85.8	
Total	54	100	52	100	106	100	
Infant formula							0.552
Yes	16	30.2	13	25.0	29	27.6	
No	37	69.8	39	75.0	76	72.4	
Total	53	100	52	100	105	100	
Fruit juice							0.801
Yes	6	11.3	5	9.8	11	10.6	
No	47	88.7	46	90.2	93	89.4	
Total	53	100	51	100	104	100	
Fruit							0.119
Yes	3	5.6	8	14.6	11	10.1	
No	51	94.4	47	85.4	98	89.9	
Total	54	100	55	100	109	100	
Salty porridge							0.357
Yes	4	7.4	7	12.7	11	10.1	
No	50	92.6	48	87.3	98	89.9	
Total	54	100	55	100	109	100	
Other foods							0.073
Yes	-	-	3	5.9	3	2.9	
No	53	100	48	94.1	101	97.1	
Total	53	100	51	100	104	100	

Table 2 outlines the food intake characteristics the day before the data collection of children between six and 23 months old. A total of 55.6% of infants were not breastfed, 57.2% drank more than two glasses of non-human dry milk formula, 82.1% ate fruits, 74.1% ate legumes and vegetables, 78.5% ate meat and 76.1% ate beans. Most children who were not fed beans ($p < 0.01$) or family meals at dinner ($p < 0.01$) but were breastfed ($p < 0.01$) the previous day were between six and 11 months old.

The data on the introduction of foods to children between six and 23 months (Table 3) showed that 31.9% of children younger than six months were fed honey, sugar or molasses, and 44.4% were fed salty porridge. On average, 55.4% showed risk behaviors for obesity, with the exception of eating while watching TV, which 67.4%

reported not doing. A comparison between age groups showed a significantly increased intake of soft drinks and processed juices and watching TV while eating among children between 12 and 23 months old, despite the already high intake of processed juices among children six to 11 months old (48.2%).

An analysis of the relationship between the sociodemographic profiles and dietary intake of children younger than six months (Table 4) showed that the mean value of the Profile 1 score was significantly higher among children fed water/tea ($p = 0.047$), cow's milk ($p = 0.030$) and salty porridge ($p = 0.019$) than that observed among the children who were not fed such foods during the previous day. The mean value of the Profile 2 score was significantly higher among children breastfed on the previous day ($p = 0.048$)

Table 2. Number and percentage of children between six and 23 months old by age group and dietary intake on the previous day. Diadema/SP, 2012.

Variable	Age				Total		p
	6 to 11 months		12 to 23 months		n	%	
	n	%	n	%			
Breastfeeding							0.000
Yes	53	63.1	49	33.6	102	44.4	
No	31	36.9	97	66.4	128	55.6	
Total	84	100	146	100	230	100	
Non-human dry milk formula							0.038
More than two glasses	44	53.7	91	59.1	135	57.2	
Up to two glasses	13	15.8	37	24.0	50	21.2	
No intake	25	30.5	26	16.9	51	21.6	
Total	82	100	154	100	236	100	
Vegetables/legumes							0.956
Yes	58	74.4	114	74.0	172	74.1	
No	20	25.6	40	26.0	60	25.9	
Total	78	100	154	100	232	100	
Fruit							0.215
Yes	63	77.8	129	84.3	192	82.1	
No	18	22.2	24	15.7	42	17.9	
Total	81	100	153	100	234	100	
Meat							0.122
Yes	59	72.8	124	81.6	183	78.5	
No	22	27.2	28	18.4	50	21.5	
Total	81	100	152	100	233	100	
Beans							0.000
Yes	49	60.5	129	84.3	178	76.1	
No	32	39.5	24	15.7	56	23.9	
Total	81	100	153	100	234	100	
Family meal at dinner							0.000
Yes	47	58.0	128	83.1	175	74.5	
No	34	42.0	26	16.9	60	25.5	
Total	81	100	154	100	235	100	

Table 3. Number and percentage of children between six and 23 months old by age group and characteristics of food introduction and feeding behaviors indicating obesity risk. Diadema/SP, 2012.

Variable	Age				Total		p
	6 to 11 months		12 to 23 months				
	n	%	n	%	n	%	
Intake of honey, sugar, molasses before six months							0.257
No	59	72.8	95	65.5	154	68.1	
Yes	22	27.2	50	34.5	72	31.9	
Total	81	100	145	100	226	100	
Intake of salty porridge/family meal before six months							0.162
No	50	61.7	75	52.1	125	55.6	
Yes	31	38.3	69	47.9	100	44.4	
Total	81	100	144	100	225	100	
Intake of processed juice/powdered drinks in the last month							0.007
No	43	51.8	48	33.6	91	40.3	
Yes	40	48.2	95	66.4	135	59.7	
Total	83	100	143	100	226	100	
Intake of soft drinks in the last month							0.000
No	63	75.9	44	30.1	107	46.7	
Yes	20	24.1	102	69.9	122	53.3	
Total	83	100	146	100	229	100	
Intake of porridge with milk or milk thickened with flour on the previous day							0.636
No	40	48.8	66	45.5	106	46.7	
Yes	42	51.2	79	54.5	121	53.3	
Total	82	100	145	100	227	100	
Ate while watching TV on the previous day							0.040
No	63	75.9	96	62.8	159	67.4	
Yes	20	24.1	57	37.2	77	32.6	
Total	83	100	153	100	236	100	

and those who were not fed types of foods different from those previously introduced ($p = 0.041$).

Conversely, the mean value of the Profile 1 score of children between six and 23 months old who were fed beans ($p = 0.040$) and the family meal at dinner ($p = 0.008$) the previous day was significantly higher than the value of children not fed such foods (Table 4). No relationship between Profile 2 and eating habits was observed in this age group.

No relationship was observed between profiles and introduction to foods or risk behaviors for obesity among children six to 23 months old.

Discussion

The use of the SISVAN protocol to assess the food intake of children younger than 24 months,

combined with the data collection performed by the eSF and the entry of these data into the computer system, renders the present study unprecedented because little of this information is currently available at the national, regional, and even municipal levels.

SISVAN generates data on the food and nutrition status of the population, especially children younger than two years, using data collected via the intake markers form. However, some studies^{13,14} have found a low rate of food intake data collection and inconsistent data entry into the System, which may result from a lack of political commitment, the System's complexity and the SISVAN's exclusive technical and administrative resources¹³.

Food intake data are scarce for the general population, as noted in the present study, and the inclusion of nutritionists in the APS is inconsis-

Table 4. Means and standard deviations (sd) of the maternal socioeconomic profiles 1 and 2 scores, based on the dietary intake of children between the ages of 0 and 23 months during the previous day. Diadema/SP, 2012.

	Profile 1		p	Profile 2		p
	Mean	sd		Mean	sd	
Children < 6 months						
Breastmilk			0.129			0.048
Yes	-0.37	0.12		-0.08	0.10	
No	-0.07	0.19		-0.48	0.22	
Water/tea			0.047			0.184
Yes	-0.07	0.15		-0.33	0.16	
No	-0.45	0.14		-0.15	0.11	
Cow's milk			0.030			0.283
Yes	0.16	0.22		-0.31	0.24	
No	-0.40	0.11		-0.16	0.10	
Infant formula			0.104			0.316
Yes	-0.54	0.18		-0.27	0.19	
No	-0.25	0.13		-0.17	0.10	
Fruit juice			0.489			0.161
Yes	-0.32	0.27		-0.49	0.22	
No	-0.33	0.11		-0.18	0.10	
Fruit			0.212			0.284
Yes	-0.07	0.29		-0.01	0.33	
No	-0.34	0.11		-0.19	0.10	
Salty porridge			0.019			0.238
Yes	0.31	0.31		0.03	0.35	
No	-0.39	0.11		-0.20	0.09	
Other foods			0.139			0.041
Yes	0.34	0.27		-1.12	0.21	
No	-0.35	0.11		-0.18	0.09	
Children between 6 and 23 months old						
Breastmilk			0.353			0.086
Yes	0.18	0.09		0.16	0.09	
No	0.13	0.09		-0.03	0.10	
Non-human dry milk formulas			0.440			0.262
Adequate	0.15	0.07		0.02	0.07	
Inadequate	0.12	0.17		0.18	0.27	
Vegetables/legumes			0.337			0.230
Yes	0.13	0.08		0.01	0.10	
No	0.19	0.10		0.13	0.12	
Fruit			0.234			0.474
Yes	0.13	0.07		0.06	0.08	
No	0.25	0.17		0.07	0.20	
Meat			0.347			0.384
Yes	0.17	0.10		0.07	0.08	
No	0.11	0.14		0.02	0.15	
Beans			0.040			0.219
Yes	0.24	0.07		0.04	0.10	
No	-0.03	0.14		0.16	0.14	
Family meal at dinner			0.008			0.242
Yes	0.26	0.07		0.07	0.08	
No	-0.09	0.15		-0.03	0.13	

tent and insufficient; none of the UBS included in the study had such professionals on their staff.

The majority of professional nutritionists are involved only in the Support Center for Fami-

ly Health (*Núcleo de Apoio à Saúde da Família, NASF*), which consists of professionals from various fields who support the eSF professionals in their healthcare practices⁷.

Therefore, because of the significance of food and nutrition surveillance and data to assessing nutrition and dietary status and implementing food and nutrition initiatives, food intake data should be collected by healthcare professionals¹⁵ as part of their routine services.

The practice of collecting data for food and nutrition diagnosis by eSF professionals facilitates the identification of regional differences and risk groups, providing material for the operation of these teams, increasing their awareness and improving their services and problem-solving capabilities with regard to nutritional issues⁹.

Children were introduced to complementary foods, typically water or tea and non-human milk, early in the present study. Most children between six and 23 months old were no longer breastfed; were insufficiently fed fruits, legumes/vegetables, meats and beans; and were fed sugar, honey or molasses and salty porridge before six months. The most common inadequate feeding practices were the intake of processed juice or drinks, soft drinks, porridge with milk or milk with thickener.

Children's eating habits are controlled by several factors. Socioeconomic, cultural and familial factors are especially influential because children are still passive beings when new foods are introduced to their diets and are exclusively dependent on their mother or guardian's dietary choices¹⁶.

Some maternal factors assessed in isolation in the literature have been shown to be associated with the eating habits of young children. Maternal primiparity, age, education level and job correlated with the intake of dairy and semi-solid meals in a study assessing infants between the ages of six and 12 months¹⁷. Another study¹⁸ suggests that maternal education level has the greatest effect on the introduction of complementary foods to a child's diet in the first year of life. Other studies^{19,20} noted that the children of older mothers, those working outside the home, and those with lower education levels were more likely to experience early intake of solid foods.

A factor analysis of the maternal variables (social and environmental) was conducted to identify maternal risk profiles because food intake has several determinants. The results suggest that the mothers described by Profile 1 (lower income rates, lower education levels and PBF beneficiaries) tend to introduce complementary

feeding early. Profile 2 mothers (older, with more children and larger household sizes) tend to breastfeed infants younger than six months. Conversely, Profile 1 mothers tend to feed their six- to 23-month-old children beans and family meals at dinner. Children live in family contexts in which all of those factors are present. Therefore, knowing which combinations of factors further affect food intake and, consequently, nutritional status facilitates the development of adequate responses to children's health problems. No studies in the literature have applied factor analysis for the same purpose, precluding comparisons.

Children should be exclusively breastfed until six months of age and given complementary foods until two or more years old, according to the recommendations in "Ten steps to a healthy diet"⁶. However, a low prevalence of EBF was found in this study, similar to the levels found in the PPAM 2009²¹ (41.1% and 41.0%, respectively). Nevertheless, despite the early introduction of other foods, the prevalence of breastfeeding in the study population was higher than that observed in a national study⁵ (73.2% and 58.7%, respectively) that analyzed data from infants between 0 and 12 months old.

Several studies²²⁻²⁵ have also observed that water/tea were the earliest complementary foods introduced, followed by fruits and non-human milk, among others, as observed in this study. The introduction of non-nutritious liquids, such as teas, before six months of age promotes the early interruption of breastfeeding and provides inadequate energy and nutrition, raising the child's morbidity risk²⁴.

In this study, the frequency of non-human milk intake, with and without breastfeeding, among infants younger than six months was lower than in other samples^{21,22,26}; however, a significant increase of non-human milk intake occurred after six months. A systematic review²⁷ that sought to identify the determinants of infant eating habits suggests that the early introduction of non-human milk (before 12 months) is related to low maternal education level and low family socioeconomic status. A similar result was observed in the present study: mothers with lower education levels and lower income rates and who were PBF beneficiaries were significantly more likely to feed their children cow's milk before they reached six months old. The intake of cow's milk in the first year of life is not recommended because it is nutritionally inadequate and may lead to negative consequences, such as the development of allergies and anemia^{6,28-30}. Therefore,

when breastfeeding is not possible, the best alternative is modified infant formula. The cost of this alternative is 3.3 times higher than the expenditure of maintaining breastfeeding³¹. The cost of using cow's milk, however, is only 1.7 times higher, explaining the prevalence of this choice.

Complementary foods should be introduced gradually and daily once the child reaches six months old. These foods must be healthy and varied and should include fruits, vegetables and legumes, meats or eggs and beans. Foods considered to be risk factors for obesity, including sugar, soft drinks, and processed juices, should be avoided in the first years of life^{6,28}. The appropriate introduction of complementary foods tends to promote future healthy eating habits.

A high intake of foods considered healthy was observed in this study, although these levels were below the guideline values because the intake should be 100% among children older than six months. Furthermore, the early introduction of salty porridge and family meals (before six months) occurred in nearly half the children studied, as found in the PPAM 2009²¹. However, food intake, including meat, beans and the family meal at dinner, significantly increased with age, as was found in another study²⁴.

Silveira and Lamounier²² also noted an early and insufficient intake of healthy foods, including fruits, vegetables, rice, beans and meats, among children younger than 24 months, suggesting that such inadequate eating habits may be related to cultural factors, including the parents' fear of feeding children between six and 12 months semi-solid or solid foods.

Saldiva et al.¹⁷ noted in their study of the eating habits of six- to 12-month-olds in the State of São Paulo that at six months, children were highly likely to be fed dairy-based meals, such as porridges and soups, and were less likely to be fed family meals.

The consistency of the salty porridge was not assessed in this study, although it should be pasty when first introduced in complementary feeding and become increasingly solid as the child ages to reach the recommended energy density and meet the child's nutritional needs^{6,17,28,32}. The intake of the family meal at dinner was not prevalent among children between six and 12 months and occurred in three-fourths of the oldest children, indicating that it may be replaced by a non-human milk-based meal. This practice may lead to nutritional deficiencies, especially of iron, because the meal containing foods rich in this mineral has been suppressed. Other studies³³⁻³⁶

have also noted the prevalence of meals based on non-human milk, some of which are supplemented with thickener, a practice also observed in this study. Thickeners are ultimately an energy supplement with low nutritional value.

As observed in this study, other research studies^{37,38} have reported a high prevalence of the early intake of sugar, soft drinks and processed juices among infants in the first year of life. This may contribute to the establishment of unhealthy habits that persist into adulthood because children's experiences in the first five years of life are crucial to the formation of preferences and food aversions³⁹.

The rates of watching TV while eating were significantly higher among the oldest children. This habit is concerning because it promotes excess weight in this age group, both because of its distracting nature and because it results in intensive exposure to obesogenic advertisements, which may affect food choices that contribute to inadequate eating habits⁴⁰.

The cross-sectional design of the study precluded the identification of the time of exposure to dietary risk or protection factors and its relation to nutritional status.

The use of the SISVAN dietary intake markers form to collect data precluded a comparison between intake and the nutritional recommendations for the age group, though it facilitated the identification of intake trends. Moreover, no other studies using this data collection instrument were found in the literature.

Furthermore, the form collects no data on the intake of foods with low nutritional value, including supplementation with sugar and thickener, among children younger than six months, though this practice is prevalent in everyday childcare. The lack of data on the consistency of foods fed to children younger than two years should also be noted because such information would indicate whether adequate energy density has been achieved⁴. Moreover, the mean duration of BF among children younger than two years of age and the prevalence of EBF among children between six months and two years could not be assessed because such data are collected by month and concern an event that occurred in the past; such data would therefore depend exclusively on maternal memory. Systematic food and nutrition surveillance is one way to gather more reliable information about such habits, as proposed by the SISVAN⁸.

Currently, the dietary intake markers form is being upgraded⁴¹. The changes made minimize

some of the limitations of this study; however, it is premature to say that such changes will enable researchers to gather more information than the current form.

Notably, the ACS used the SISVAN to gather the data used in this study, as recommended by the Brazilian Ministry of Health. Although the SISVAN's significant role in supporting health-promoting initiatives is recognized, this system has not been used to its full potential to generate information about one of the most important determinants of health status.

Conclusion

This study identifies two maternal sociodemographic profiles. The first profile, comprising mothers with lower income rates, lower education levels and PBF beneficiaries, is apparently at risk for the early introduction of complementary foods.

Furthermore, infants between 0 and 23 months seen at the Diadema UBS included in

this study conclusively showed inadequate food intake. Weaning and the introduction of complementary feeding occurred early; the intake of fruits, legumes/vegetables, meats and beans was insufficient; and inadequate feeding practices, including the intake of processed juices or soft drinks, sodas, porridge with milk or milk thickened with flour, were common.

This study shows the feasibility of conducting food and nutrition surveillance in primary healthcare and generating data and research studies based on the SISVAN, which includes key components for the assessment of child nutrition, despite the aforementioned limitations of the instrument used.

Early identification of unhealthy eating habits through the use of SISVAN by all eSF professionals, combined with the implementation of public food and nutrition policies promoting breastfeeding and the timely and adequate introduction of complementary feeding and healthy eating habits, may improve the behavior of those responsible for infant feeding, thus improving the eating habits of the study population.

Collaborations

LC Coelho, L Asakura, A Sachs, I Erbert, CRL Novaes and SGA Gimeno equally contributed to all stages of the preparation of the manuscript.

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