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Responsive feeding patterns during early childhood in urban areas. Argentina, 2018–2019

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ABSTRACT

Introduction. Dietary quality involves both the quantity and quality of food offered, the way and the setting in which it is offered, and the responses of the person offering it. The objective of this study was to identify behavioral patterns related to responsive feeding in children aged 6 to 23 months in urban areas from Argentina in 2018–2019.

Population and methods. Secondary analysis based on data from the second National Survey on Nutrition and Health of 2018–2019 conducted in a multistage probability sample from urban areas of 5000 inhabitants or more in Argentina. A descriptive analysis and a principal component analysis were performed to identify responsive feeding patterns in 4379 children aged 6 to 23 months.

Results. Five responsive feeding patterns were identified; the first 2 dimensions explained 71.1% of inertia (p = 0.013). The pattern with a prevailing possibility of experimentation, autonomy, interaction, and the absence of screens, rewards and distractions was associated with children older than 12 months from the central and south regions (Cuyo, Pampa, Greater Buenos Aires, and Patagonia), whereas the pattern related to a lower autonomy, experimentation, and self-regulation corresponded to children aged 6 to 11 months from the Northwest and Northeast regions.

Conclusion. There is evidence of responsive feeding practices that correspond to distinguishable patterns, associated with different stages of life and with the region where the children live.

Keywords: *complementary feeding; nutritional surveys; child; Argentina.*

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INTRODUCTION

The development of healthy eating behaviors depends as much on offering healthy foods as it does on how, when, where, and by whom they are offered.[1] Feeding practices refer to behaviors or strategies used by caregivers and which shape feeding patterns;[2] when these are responsive, they focus on children's needs, encourage them to eat autonomously and in response to physiological and developmental needs, which may promote eating self-regulation and support cognitive, emotional, and social development.[3,4]

The recommendations encourage minimizing distractions during mealtimes and using that time to learn by talking to them and maintaining eye contact.[5] The Dietary Guidelines for the Argentinean Children Population (Guías Alimentarias para la Población Infantil, GAPI) also recommend paying attention to food, encouraging children to touch food and not to watch TV during mealtime.[6]

A poor quality diet is recognized as one of the major barriers to survival, healthy growth, development, learning, prevention of chronic diseases, and malnutrition in all its forms. Food is a basic right;[7,8] therefore, establishing healthy eating habits at an early age is part of a relevant strategy to prevent the situations mentioned above.[8,9] The objective of this study was to identify behavioral patterns related to responsive feeding in children aged 6 to 23 months in urban areas from Argentina in 2018–2019.

POPULATION AND METHODS

Type of study and source of data

Secondary analysis based on data from the second National Survey on Nutrition and Health (Encuesta Nacional de Nutrición y Salud 2, ENNyS 2) conducted in Argentina between 2018 and 2019 (available at http://datos.salud.gob.ar/dataset/ennys2). The survey was based on a multistage probability sample of urban areas of ≥ 5000 inhabitants. This analysis used the data from the questionnaire administered to children up to 23 months old (n = 5763) and the sociodemographic questionnaire.[10]

Variables

The descriptive analysis used the eating habits and commensality block applied to children aged 6 to 23 months. For the multivariate analysis, the dichotomous variables "always and almost always" (1) and "never and sometimes" (0) were used. The following variables were included: 1) talking to the child during mealtime (Tlk); 2) using screens during mealtime (Scr); 3) allowing the child to grab food on their own (Grb); 4) serving the child's food in an individual plate with their portion (Plt); 5) allowing the child to eat until they are satisfied (St); 6) playing some kind of game to distract the child so that they eat more (Ply); and 7) using soft drinks, candies, toys or other rewards when they believe the child ate well (Rwd). The frequency of eating with other people was excluded from the multivariate analysis because the percentage of affirmative answers exceeded 90%. Variables that represented perceptions and not behaviors, such as frequency of considering mealtime to be pleasant and perception of the amount of food consumed, were included only for descriptive analysis.

The sociodemographic variables were sex and age of the child (truncated), sex and level of education of the head of household, health coverage, region of residence, household income level, status as indigenous individual or descendant of indigenous peoples, and participation in a food assistance program for the household. Age was grouped into 3 categories: 6 to 11 months (E_6), 12 to 17 months (E_12), and 18 to 23 months (E_18); for the remaining variables, the categorization provided in the database was considered.[10]

Data analysis

A multiple correspondence analysis (MCA) was done. The MCA is a way of summarizing and visualizing categorical data, given that, by grouping the categories of the different variables that are close to each other, it allows the sample to be characterized by different sets of categories to define patterns or types of behavior and relationships among the selected variables. The best model included the following variables: Tlk, Scr, Grb, Plt, St, Ply. Two secondary or passive variables were considered: region and the child's age.

Different statistical models were used; the one with the greatest inertia (dispersion), understood as a multidimensional generalization of the variance, with respect to any point in space and weighted, and the best distribution of variables, was selected. Sex was excluded because the categories were grouped in the center of the chart, as well as missing data and "Does not know, does not answer" responses. The MCA was performed using the "adjusted" method, which estimates the

percentage of inertia explained by the primary dimensions, as well as the level of contribution of the different categories. Estimates were made according to the primary variables selected; then, the patterns adopted by adding the secondary variables (region and age) were observed. Subsequently, a cluster analysis was performed using partitioning (with k-means algorithm) and hierarchical methods, and the corresponding two-dimensional plots (clusplot) and dendrogram were obtained. The data analysis was done with the R software, version 4.2.2, by the R Foundation for Statistical Computing. Different packages were used: car, cluster, MASS, NbClust. The significance level was established at $\alpha = 0.05$.

Ethical considerations

The ENNyS 2 was authorized by the Ethics Committee of the Department of Health Research of the National Ministry of Health and Social Development. All aspects related to the development of this project were conducted in accordance with current standards.

RESULTS

A total of 4379 children aged 6 to 23 months were included; *Table 1* summarizes the sample characteristics. It is worth noting that more than half of the heads of household had not completed secondary education (59%); public health coverage prevailed (57.2%), and 54% of children lived in low or middle-low income households.

In relation to the variables referring to commensality, it was observed that most participants always ate with other people (92%); 3 out of 4 were always spoken to during meals (74%), while 1 out of 5 (20%) always or almost

Table 1. Characteristics of the sample of children aged 6 to 23 months from Argentina (National Survey on Nutrition and Health of 2018–2019)

	(n = 4397)
Age (months), mean (SD)	14.3 (5.3)
Age groups (months), *%*	
6 to 11	36.9
12 to 17	32.6
18 to 23	30.5
Girls, *%*	46.6
Female head of household, *%*	33.3
Level of education of head of household, *%*	
Incomplete secondary education (< 12 years)	59.0
Complete secondary or higher education (≥ 12 years)	39.7
Health coverage, *%*	
Public	57.2
Private company or labor union	42.5
No data	0.3
Region, *%*	
Greater Buenos Aires (GBA)	34.9
Pampa (Central region)	29.7
Northeast (NOA)	12.5
Northeast (NEA)	9.2
Cuyo	6.9
Patagonia	6.8
Family income quintile per CU, *%*	
Q1 (low)	28.4
Q2 (middle-low)	25.8
Q3 (middle)	17.9
Q4 (middle-high)	15.3
Q5 (high)	12.6
Status as indigenous individual or descendant of indigenous peoples, %	2.0
Receiving food assistance, %	33.8

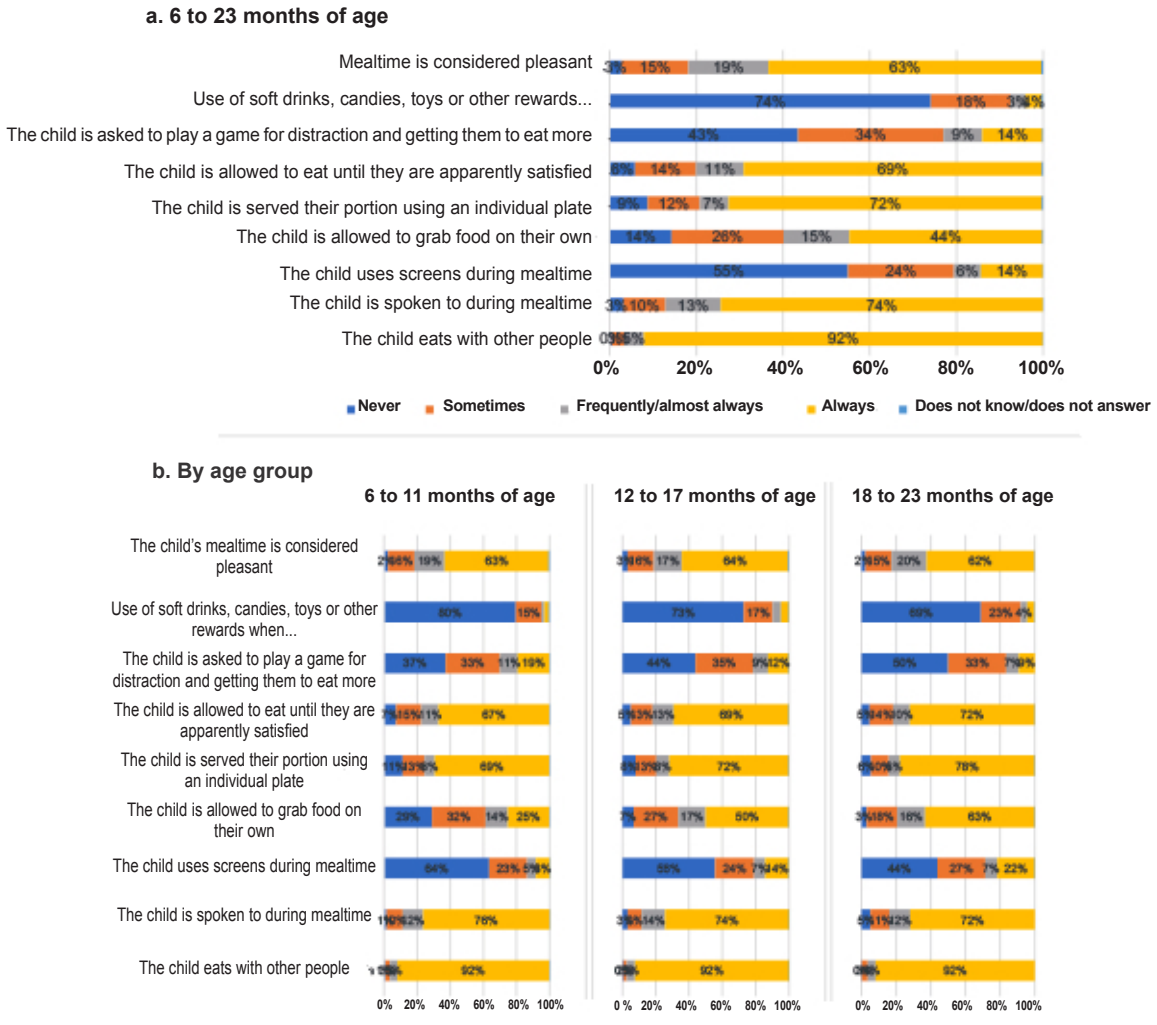
Source: Developed by the authors based on data from the Second National Survey on Nutrition and Health (ENNyS 2), Argentina 2018–2019. n: number; SD: standard deviation; CU: consumer unit.

always looked at screens during meals and half of participants (55%) never used screens during mealtime, with a higher frequency of use as age increased (*Figure 1*).

Among the variables related to experimentation, it was observed that 60% of participants were allowed to grab food with their hands, with a notable increase as they got older. Such experimentation was always allowed only in a quarter of the children from the 6- to 11-month-old group, while two thirds of the children in the 18- to 23-month-old group were always allowed to do so (*Figure 1*).

As for the variables referring to self-regulation, 7 out of 10 children always had their meals served on individual plates (their portion) (72%); this became more pronounced as age increased; 69% of children ate until they were satisfied. Only 23% of caregivers stated that they frequently or always distracted their child with games to make them eat more, while a quarter (25%) used resources, such as rewards, when they considered that their child had eaten well. With increasing age, the use of games decreased while the use of rewards increased. Most adults (81%) said that mealtimes were often or always pleasant (*Figure 1*).

Figure 1. Indicators of responsive feeding, total and by age group (%), National Survey on Nutrition and Health of 2018–2019

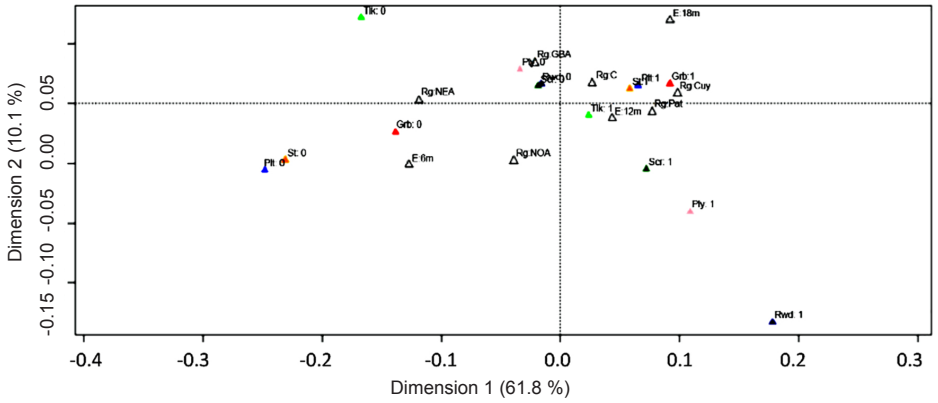


Source: Developed by the authors based on data from the Second National Survey on Nutrition and Health (ENNyS 2), Argentina 2018–2019.

In relation to the amount of food the child ate, about one third considered that it was inadequate; 14% considered that it was less than what they needed; and 15%, that it was more than what they needed.

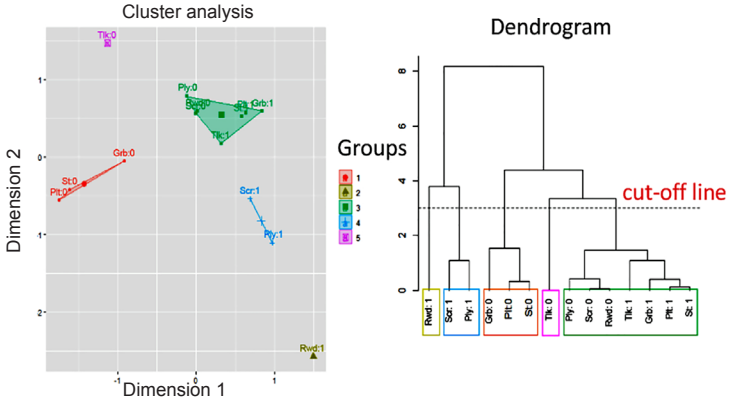
The MCA included 4319 observations (excluding "does not know/does not answer" responses) and found the 5 groups of the 4-quadrant chart (*Figure 2*). The cluster analysis confirmed such distribution (*Figure 3*), showing how the different categories of the different variables analyzed are grouped together, confirming the observations shown in *Figure 2*. The inertia explained by the first 2 dimensions was 71.1% (p = 0.013); 61.8% (p = 0.008) corresponded to the first dimension and 10.1%, to the second one (p = 0.001). Group 1 included not talking to the child during mealtime and group 2 included giving the child a reward for eating well; both were at the extremes of the chart, not grouped with other categories of the primary and secondary variables. Group 3, located in the upper right quadrant,

Figure 2. Four-quadrant chart for responsive feeding practices in children aged 6 to 23 months. Argentina, National Survey on Nutrition and Health of 2018–2019



Source: Developed by the authors based on data from the Second National Survey on Nutrition and Health (ENNyS 2), Argentina 2018–2019. Note: This type of chart includes 2 dimensions and 4 sections where the categories of the variables analyzed are distributed in a more or less clustered form. 0 means "No" and 1, "Yes." Grb: allowing the child to grab food on their own, A: age, Tlk: talking to the child during mealtime, Ply: playing some kind of game to distract the child so that they eat more, Plt: having an individual plate, Rwd: use of soft drinks, candies, toys or other rewards when they believe the child ate well, Scr: using screens during mealtime, St: allowing the child to eat until they are satisfied, Rg: region.
GBA: Greater Buenos Aires Area, NOA: Northwest region; NEA: Northeast region; Cuy: Cuyo; Pat: Patagonia.

Figure 3. Cluster and dendrogram of variables for behavioral patterns using k-means (k = 5). Multiple correspondence analysis based on the National Survey on Nutrition and Health of 2018–2019



Source: Developed by the authors based on data from the Second National Survey on Nutrition and Health (ENNyS 2), Argentina 2018–2019. Note: The initial units are grouped and clustered until, at the end of the process, all the cases treated are included in the same cluster. 0 means "No" and 1, "Yes." Grb: allowing the child to grab food on their own, A: age, Tlk: talking to the child during mealtime, Ply: playing some kind of game to distract the child so that they eat more, Plt: having an individual plate, Rwd: use of soft drinks, candies, toys or other rewards when they believe the child ate well, Scr: using screens during mealtime, St: allowing the child to eat until they are satisfied.

groups together children who are allowed to grab their food, eat using an individual plate, are spoken to during mealtime, are apparently satisfied when they finish eating, do not use screens during mealtime, are not asked to play games during mealtime, and are not given rewards for eating well. This was consistent across children older than 12 months and from the central and south regions of Argentina (Cuyo, Pampa, Greater Buenos Aires, and Patagonia). Group 4, in the lower right quadrant, includes children who eat while using a screen and those who play games to eat. Finally, group 5, the pattern in the lower left quadrant, corresponds to children who are not allowed to grab food, are not served on individual plates, and are apparently not satisfied when they finish eating; this was consistent across children from the Northwest and Northeast regions and between 6 and 11 months of age (*Figure 2*).

DISCUSSION

The results of this study show responsive feeding practices that are consistent with differentiated patterns. It should be noted that eating with other people is routine for children aged 6 to 23 months, with figures similar to those observed in the ENNyS 1,[11] while talking to them during mealtime was a frequent behavior, but with lower figures than those observed in 2005, which had reached 97%. The use of screens during mealtime was lower than the 36% observed of the ENNyS 1, which only referred to TV use,[11] with an increasing frequency as they get older. With the extensive use of digital devices and the penetration of digital content marketing, the percentage observed in this study was encouraging; however, it requires efforts to continue its reduction, given the recommendations and their influence from an increasingly younger age.

Experimentation is important in development; however, the frequency of caregivers who mentioned allowing the child to grab their food was lower than that observed in the ENNyS 1 (78%).[11] Regarding behaviors that encourage self-regulation, it was observed that most children were served their food on an individual plate and were allowed to eat until they were satisfied.

Non-responsive practices linked to self-centered feeding strategies by caregivers include coercion and psychological control, without considering the emotional or psychological needs of children, such as pressuring them to eat or offering rewards or prizes for eating; these practices have been widely studied and have been associated with childhood obesity.[5] It was observed that one fifth of the children were distracted so that they would eat more, while most of the caregivers stated that they did not reward them with food of poor nutritional quality or toys when the children ate well, a practice that becomes more frequent with increasing age. According to the pattern analysis, the latter behavior was associated with the use of screens, both considered inappropriate or inadvisable practices that are related to greater food consumption[12] and low nutritional quality.[13] In Argentina, 13.6% of children under 5 years of age are overweight.[10] This is a widespread situation in the region,[14] which is probably explained by multiple underlying causes, linked to settings, high availability of and accessibility to food and beverages of poor nutritional quality, together with a food system that does not respond to the nutritional needs of children.[15]

The way parents and caregivers feed their children has been an important issue in both high- and low-income countries to prevent malnutrition in all its forms.[1,16] Therefore, it is important to have local data on this issue, beyond the nutritional quality of the food offered to children.

The analysis of the characteristics in isolation, or a bivariate analysis, gives us a partial and unorganized version. It is necessary to take into account the convergence of all the characteristics, both those related to the behavior of the adult caregiver offering the food and other, more structural, characteristics,[17] such as age and region of residence, in order to think of preventive strategies for a comprehensive approach. In this context, the MCA technique allows to assess the existence of behavioral patterns or profiles.[18] Five responsive feeding patterns were identified in children from urban areas of Argentina. On the one hand, there is a pattern related to practices that follow the recommendations in children older than 1 year living in the central and south regions, but, on the other hand, we noticed a pattern that departs from the recommendations in children younger than 1 year living in the north of the country.

Given the changes involved, complementary feeding is a challenge for the whole family because it requires learning both for the children, who are experiencing new tastes, smells, textures, and situations, and for their caregivers, who must accompany them along the way, and it is often a time of tension and frustration, considered not pleasant by one fifth of the caregivers.

These findings are relevant for the necessary update of the GAPI of 2006,[6] as their recommendations should be revised in the light of new evidence. Although a clinical practice guideline on complementary feeding for infants under 2 years of age was recently developed,[19] it does not include aspects related to responsive feeding. It is also necessary for dietary policies to consider aspects of responsive feeding and rearing, beyond the quantitative aspects of feeding during childhood, given the wide evidence documenting how responsive feeding patterns shape future commensality, decrease the risk for malnutrition in all its forms, and have an impact on the various chronic diseases that are responsible for more than two thirds of the causes of disease and death globally.[20] In this regard, it should be noted that, in Argentina, 13.6% of children younger than 5 years are overweight and 8% are stunted,[10] a situation that has not improved since the conduct of the ENNyS 1.

It is necessary to consider that a limitation of this study was that the sample was not representative of small urban and rural areas. In addition, being an analysis of secondary sources, it had to be adapted to the availability of information without the possibility of adding other outcome measures, while the cluster analysis involves collapsing information and losing the richness of the original data in order to search for related outcome measures with greater explanatory power. The MCA has a qualitative approach, allows for the identification of priority groups, but limits the knowledge of magnitudes and the establishment of associations.

There is evidence of responsive feeding practices that correspond to distinguishable patterns, associated with different stages of children's lives and depending on the region where they live. In addition, a large number of children live in households with adverse socio-demographic conditions, a situation that may be more serious in rural areas, affecting their living conditions and related to dietary patterns. ■

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