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Food diversity and consumption of ultra-processed food in the complementary feeding: National Health Survey, Brazil, 2013

Diversidade alimentar e consumo de alimento ultraprocessado na alimentação complementar: Pesquisa Nacional de Saúde, Brasil, 2013

Diversidad alimentaria y consumo de alimentos ultraprocesados en la alimentación complementaria: Encuesta Nacional de Salud, Brasil, 2013

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Abstract
Objective: To assess food diversity and absence of consumption of ultra-processed foods in complementary feeding of Brazilian children aged between six and 24 months according to socio-demographic variables. Methods: It is a cross-sectional study that analyzed data from the National Health Survey, 2013. The food diversity and ultra-processed foods consumption were evaluated separately and together. The joint analysis was measured by score, considering the consumption of each food group that constituting food diversity, as well as the absence by each of ultra-processed foods. It was estimated prevalence, means score and confidence intervals (95%). Socio-demographic variables analyzed: gender, race, household situation, macro-regions and household conditions. Results: Of the 3701 eligible children, only 3.8% had nutritional adequacy (food diversity and absence of ultra-processed foods), 48.8 % had food diversity, and 15.7 % did not consume ultra-processed foods. Children with low socioeconomic status had a lower score on the nutritional adequacy and a lower prevalence of food diversity and a higher prevalence of ultra-processed foods consumption. Conclusions: A large portion of Brazilian children have low feeding diversity and consume ultra-processed foods, with inequalities related to the socioeconomic status and macro-region. Public policies and health care actions must consider these differences to reduce the disparities.
Keywords: Complementary Food; Food Consumption; Socioeconomic factors; Demographic Indicators; Health Status Disparities.

Resumo

Objetivo: Avaliar a diversidade e ausência de alimentos ultraprocessados na alimentação complementar de crianças brasileiras com idade entre seis e 24 meses, segundo variáveis sociodemográficas. Métodos: Trata-se de um estudo transversal que analisou dados da Pesquisa Nacional de Saúde de 2013. A diversidade e o consumo de alimentos ultraprocessados foram avaliados separadamente e em conjunto. A análise conjunta foi medida por escore, considerando o consumo dos grupos de alimentos que compõe a diversidade e pela a ausência de cada um dos alimentos ultraprocessados. Estimou-se a prevalência, média dos escores e intervalos de confiança (95%). Variáveis sociodemográficas analisadas: gênero, raça, macrorregiões, situação e condições do domicílio. Resultados: Das 3.701 crianças elegíveis, 3,8% apresentaram adequação nutricional (diversidade e ausência de ultraprocessados), 48,8% apresentavam diversidade e 15,7% não consumiam alimentos ultraprocessados. Crianças de baixo nível socioeconômico apresentaram menor escore de adequação nutricional, menor prevalência de diversidade e maior prevalência de consumo de ultraprocessados. Conclusões: Grande parte das crianças brasileiras apresenta baixa diversidade alimentar e consome alimentos ultraprocessados, com inequidades marcadas pela questão socioeconômica e pela região de residência. As políticas públicas e as ações de atenção à saúde devem considerar essas diferenças a fim de diminuir as disparidades encontradas.

Palavras-chave: Alimentação Complementar; Consumo Alimentar; Aspectos socioeconômicos; Indicadores Demográficos; Desigualdades em saúde.

Resumen

Objetivo: Evaluar la diversidad alimentaria y la ausencia de consumo de alimentos ultraprocesados en la alimentación complementaria de niños brasileños de entre seis y 24 meses según variables sociodemográficas. Métodos: Se trata de un estudio transversal que analizó datos de la Encuesta Nacional de Salud, 2013. La diversidad de alimentos y el consumo de alimentos ultraprocessados se evaluaron por separado y en conjunto. El análisis conjunto se midió por puntaje, considerando el consumo de cada grupo de alimentos que constituye diversidad de alimentos, así como la ausencia por cada uno de los alimentos ultraprocesados. Se estimó la prevalencia, puntuación media e intervalos de confianza (95%). Variables sociodemográficas analizadas: género, raza, situación del hogar, macrorregiones y condiciones del hogar. Resultados: De los 3701 niños elegibles, solo el 3.8% tenía adecuación nutricional (diversidad de alimentos y ausencia de alimentos ultraprocesados), el 48.8% tenía diversidad de alimentos y el 15.7% no consumía alimentos ultraprocesados. Los niños con nivel socioeconómico bajo tuvieron una puntuación más baja en la adecuación nutricional y una menor prevalencia de diversidad alimentaria y una mayor prevalencia de consumo de alimentos ultraprocesados. Conclusiones: Una gran parte de los niños brasileños tiene baja diversidad alimentaria y consume alimentos ultraprocesados, con desigualdades relacionadas con el nivel socioeconómico y macrorregión. Las políticas públicas y las acciones de salud deben considerar estas diferencias para reducir las disparidades.

Palabras clave: Alimentos complementários; Consumo de alimentos; Factores socioeconómicos; Indicadores demográficos; Disparidades en el estado de salud.

1. Introduction

Adequate and healthy feeding is essential for promoting health, especially in the complementary feeding (CF) stage, from six to 24 months of age. This time is a critical and vulnerable period in the child's life, with increased energy and nutritional needs, being a phase of the high risk of stunted growth. (BRASIL et al., 2019). Eating habits acquired in childhood tend to be permanent in adulthood, and inadequate habits could predict consequences on the nutritional status, such as obesity, and the development of chronic non-communicable diseases (Nicklaus, 2009; Obbagy, English, Psota, et al., 2019; Obbagy, English, Wong, et al., 2019; Taylor et al., 2017).

The CF must follow the child's physiological maturity and guarantee an adequate supply of nutrients, ensuring total growth and development of the child (United Nations Children's Fund (UNICEF), 2020) According to the Food Guide for Brazilian Children under Two, a proper and healthy diet should be based on unprocessed and diversified and food groups. Also, it should not contain ultra-processed foods (UPF) as cookies, soft drinks, and candies (BRASIL et al., 2019).

Oliveira and collaborators (2015) consider that the diversity of food groups and the absence of the consumption of UPF are essential indicators of CF nutritional adequacy. UPFs usually contains excessive amounts of calories, salt, sugar, fats and additives, low levels of vitamins and minerals and their consumption is associated with a higher risk to the child's health(BRASIL et al., 2019). Food diversity is also a quick and straight indicator of the adequacy of energy and micronutrients in the diet(Steyn et al., 2006; United Nations Children's Fund (UNICEF), 2020). CF composed by different food groups helps

to support the learning of flavors and expand the repertoire of children's food preferences, which can have an impact on dietary patterns and health in later stages of life (Schwartz et al., 2011). This indicator is considered by the World Health Organization as one of the critical markers of CF nutritional adequacy (WHO, 2010).

Studies have shown that a large portion of child population has inadequate eating practices, with the presence of unhealthy foods, and limited food diversity with by the absence of some fundamental food (Bortolini et al., 2015, 2019; Karnopp et al., 2017; Lopes et al., 2018; M. I. C. de Oliveira et al., 2017; Relvas et al., 2019) Social, economic, and demographic factors influence CFs. Children in worse socioeconomic situations usually had poor feeding practices (Bortolini et al., 2015; Dallazen et al., 2018; Rinaldi & Conde, 2019; Sotero et al., 2015). However, most studies were performed in small population groups, restricted to specific locations (Dallazen et al., 2018; Karnopp et al., 2017; Sotero et al., 2015) or related to specific food markers, such as the consumption of soft drinks and cookies (Jaime et al., 2016; Saldiva et al., 2014).

Information about the CF nutritional adequacy, at the national level, is still scarce when considering the components of the diversity of food groups allied with the absence of UPFs consumption and its association with socio-demographic factors.

This study aims to assess CF nutritional adequacy, composed by indicators of food diversity and absence of UPFs consumption of Brazilian children aged between six and 24 months according to socio-demographic variables.

2. Methodology

It is a cross-sectional descriptive study carried out using secondary data from the National Health Survey (NHS). The NHS was conducted by the Brazilian Institute of Geography and Statistics in 2013, in partnership with the Ministry of Health utilizing a representative sample of Brazil, macro-regions, urban and rural population, and capitals. The collection of data took place from August 2013 to February 2014.

The sampling plan was a cluster sampling in three stages, with stratification of the primary sampling units (PSU). The census sectors were the PSU, the households were the second stage units, and the residents aged 18 or over defined the third stage units. Children under two years of age were identified in the second stage, while a fixed number of permanent private households in each PSU were selected by simple random sampling through the National Address Register for statistical purposes. After the end of the collection, interview records were obtained in 64,348 households, with a loss rate of 20.8%. NHS methodological details were described in a previous publication.(Roberto Borges de Souza-Júnior et al., 2015) In this study, all children aged between six and 24 months living in the sample households were considered eligible. Children under 6 months were excluded because they shouldn´t be in the CF due to the official recommendation (BRASIL et al., 2019). The questions regarding children were answered by mothers or guardians (Souza-Júnior et al., 2015).

The characterization of children's CF was carried out according to module L - "Children under two years old" present in the NHS questionnaire, based on the question about what the child consumed in the last 24 hours. These “food consumption markers form” aims to evaluate the food pattern in children under 2 years, identifying the consumption of healthy foods - such as fresh foods, and unhealthy foods - such as UPF (Brasil et al., 2015)

The answer options were "yes" or "no" for the consumption of the following foods: breastmilk; other milk or milk products; water; tea; porridge; fruit or natural fruit juice; artificial juices; greens/vegetables; beans or other legumes; meats or eggs; potatoes and other tubers and root; cereals and derivatives; biscuit or cookie or cake; candies or other sweetened foods and soft drinks.

The assessment of CF nutritional adequacy considered two of the indicators proposed by Oliveira and collaborators6: diversity of food groups and no consumption of UPF. Such indicators were evaluated separately and together. Concerning

difference, the index proposed here consists of six groups (cereals and tubers; vegetables; fruits; meat or egg; legumes; milk and dairy products - including maternal) and considers that it has been reached if the child consumes all groups of recommended foods. The absence of UPF was observed when there was no report of consumption of any of the four food groups investigated: artificial juices; biscuit or cookie or cake; candies or other sweetened foods; and soft drinks.

The degree of CF nutritional adequacy was also assessed. This variable was measured using a score, which ranged from 0 to 1. Each diversity constituting a food group accounted for 0.1 points present in the child's diet, as well as the absence of consumption by each UPF group. In effect, the higher the score, the better the quality of the CF.

For socio-demographic variables were selected those that allow assessing regional differences, living and household conditions - mainly those that interfere with eating practices such as the presence of drinking water and kitchen for food preparation. The socio-demographic variables used for the analysis were: child gender (male/female); child race (White, Black, Parda*, Asian and Indigenous); household situation (urban/rural), macro-regions (North, Northeast, Southeast, South, and Mid-west); in addition to those related to household conditions: water supply (general network /others); type of material predominant in the construction of external walls (appropriate masonry/wood and others); drainage of sanitary sewage (general network and by other means (pit, ditch, direct to river, lake or sea); the presence of kitchen at home (yes/no).

The isolated and combined prevalence of indicators of CF nutritional adequacy (food diversity and absence of UPF) were estimated, presented for Brazil (national level), and the different socio-demographic variables. The differences between the estimated prevalence indicators in the categories of variables were evaluated using the Qui-square test, considering a significance level of 5%. The means and respective 95% confidence intervals of the scores of nutritional quality of CF, according to socio-demographic variables were also estimated.

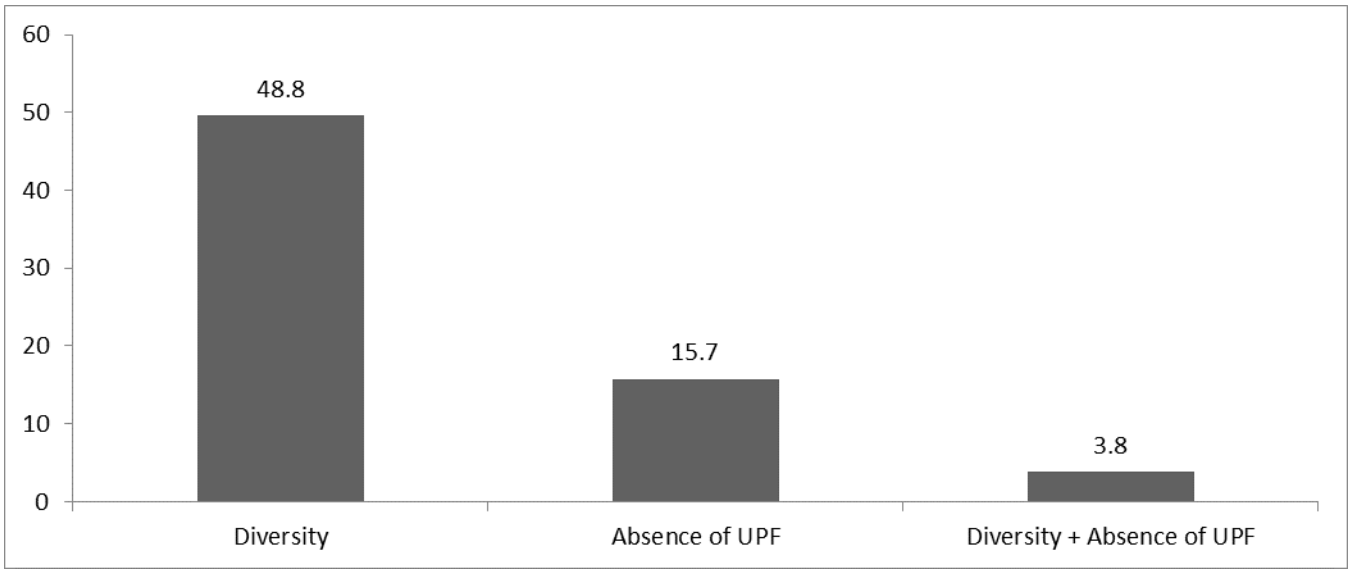
Data analysis was performed using Stata software (12.0). The "survey" command was used to analyze a complex sample.

The NHS was approved by the National Commission for Ethics in Research for Human Beings, of the Ministry of Health, under Opinion No. 328.159/2013.

3. Results

Out of the 5,458 children under two years old who were the NHS sample in 2013, 67.8% were considered eligible for the present study. Less than half (48,8%) of the children consumed all recommended food groups, and 15,7% of children not consumed UPFs in the last 24 hours. Only 3.8% of children had CF nutritional adequacy considering the indicators of food diversity and absence of UPFs, altogether (Figure 1). The average number of food groups consumed by children was 4.98 (CI: 4.92 - 5.05).

Figure 1. Percentage of children with diversity and/or absence of consumption of ultra-processed foods (UPF) in complementary feeding. National Health Survey, Brazil. 2013.



Source: Authors.

Except for sex, the food diversity of CF was significantly associated with the socio-demographic characteristics investigated. Children who live in better situations had greater variety compared to their peers. The North/Northeast regions had a lower percentage of children with food diversity compared to the other regions. The diversity of food was also more prevalent in the urban area, and in white and Asian children. The frequency of diversified food was at least 32.0% higher among children living in households with better living conditions, when compared to those who live in household without: kitchen, built with inappropriate materials, without general water supply and sewage network (Table 1).

Regarding the lack of consumption of UPFs, the results showed that living in less developed regions of the country, North/Northeast, is associated with a higher prevalence of absence of consumption of these food types. Likewise, those who live in households with worse housing conditions do not consume UPFs with greater frequency. No significant differences were observed in the consumption of UPFs, regarding sex, race, census situation, and presence of a sewage network at home (Table 1).

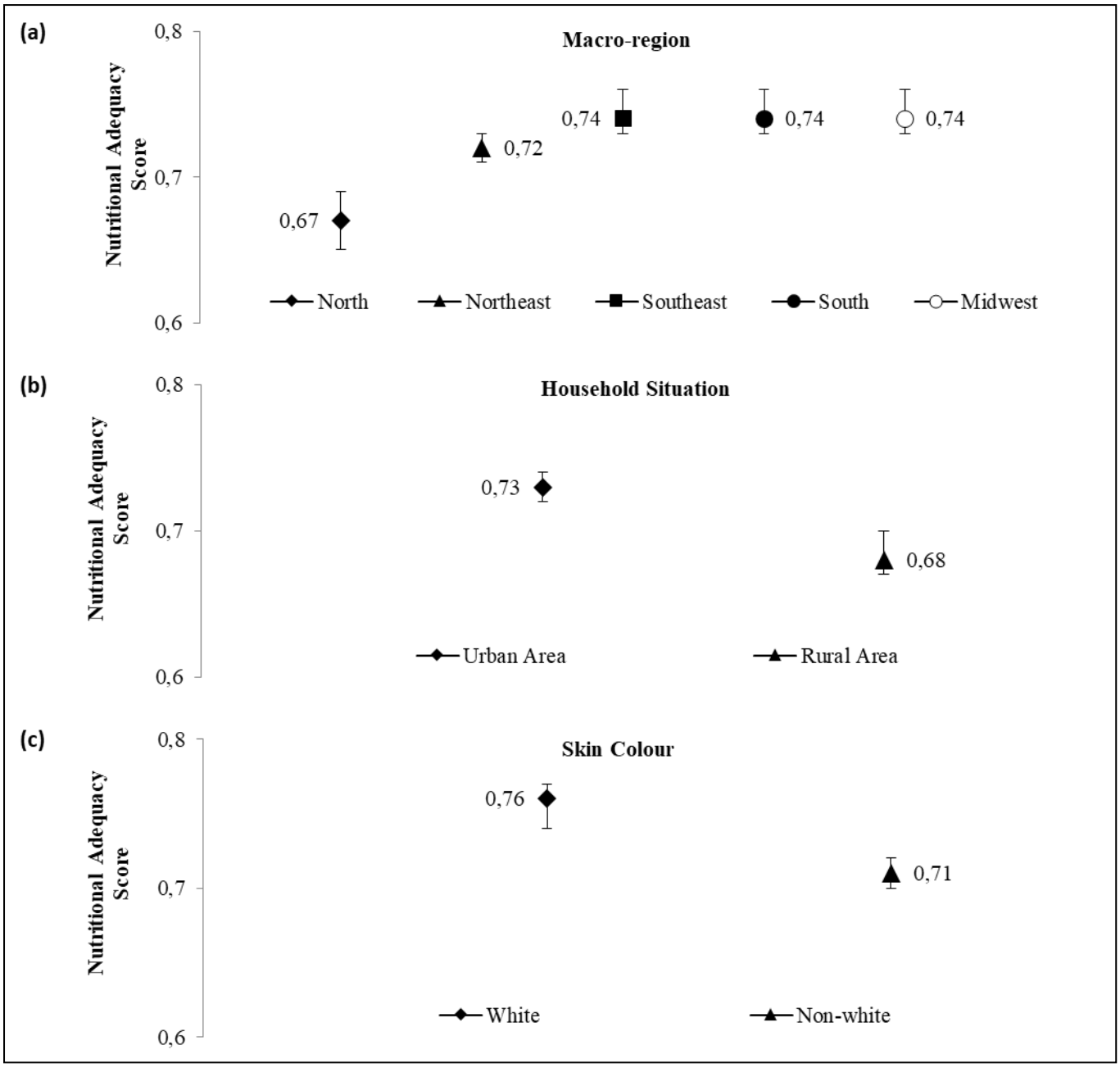
Table 1. Profile of food diversity and absence of consumption of ultra-processed foods (UPF) in complementary feeding according to socio-demographic characteristics of children aged 6 to 24 months. National Health Survey, Brazil, 2013.

	Food Diversity	P value	**Absence of UPF[a]**	P value
Sex				
Male	48.8	0.953	16.4	0.981
Female	48.9		14.9	
Race				
White	57.3		16.3	
Black	46.9		8.0	
Pardo[b]	40.4	<0.001	16.3	0.031
Asian	57.2		3.7	
Indigenous	26.3		28.7	
Macro-region				
North	26.6		23.0	
Northeast	37.8		17.5	
Midwest	58.9	<0.001	14.5	0.006
Southeast	58.7		12.3	
South	57.5		10.8	
Household Situation[c]				
Urban Area	50.7	<0.001	15.92	0.122
Rural Area	29.3		20.16	
Water Supply[c]				
General network	50.3	<0.001	15.6	0.042
Other	33.4		20.8	
Building Material[c]				
Suitable Masonry / Wood	47.7	<0.001	16.2	0.002
Others	20.9		32.5	
Sanitary sewage[d]				
General network	56.1	<0.001	15.0	0.256
Other	38.2		17.5	
Kitchen[†]				
Yes	47.4	0.012	16.4	0.008
No	32.2		27.9	

[a]UFP: ultra-processed foods; [b] In Brazil the term "*pardo*" is used to describe black people with clear skin; [c] Missing data for 649 children; [d] Missing data for 905 children.
Source: Authors

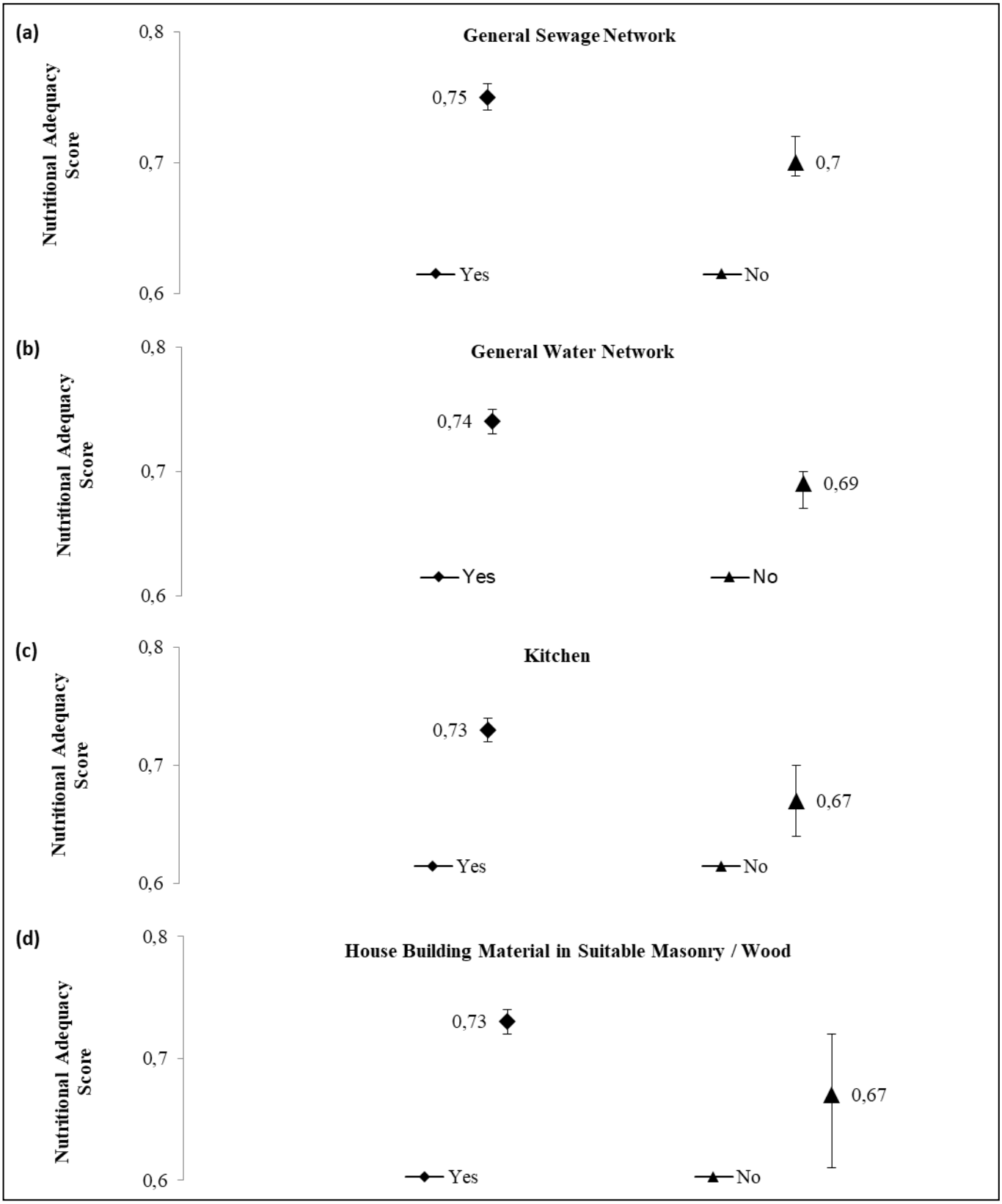
An average score of 0.68 (EP = 0.16) of CF quality was found in the total number of children. It is noteworthy that the average score was significantly associated with the socio-demographic characteristics, with higher values found among children who portray better social and life situations versus their peers: white vs non-white; who lived in an urban area vs rural; in the most developed regions of the country (Southeast, South and Midwest) vs the least developed (North/Northeast); living in households with a general water network vs without a general water network; with sanitary sewage vs without sewer; with kitchen vs without kitchen and with adequate building materials vs inadequate (Figures 1 and 2).

Figure 2. Means and 95% confidence intervals of the score for the nutritional adequacy of complementary feeding for Brazilian children according to macro-regions (a), household situation (b), and skin colour (c). National Health Survey, Brazil, 2013.



Source: Authors.

Figure 3. Means and 95% confidence intervals of the score of nutritional adequacy of complementary feeding for Brazilian children according to household characteristics: Presence of general sewage network (a), general water network (b), kitchen (c) and house building material in suitable masonry/wood (d). National Health Survey, Brazil, 2013



Source: Authors.

4. Discussion

It was observed that most Brazilian children do not have CF nutritional adequacy, considering the low prevalence of food diversity and the absence of consumption of UPFs. The influence of socio-demographic variables was also observed, both in protecting healthy eating (diet diversity) and in increasing exposure to risk factors (consumption of UPFs). Children in worse conditions had worse diet diversity, and children in better conditions showed higher UPFs consumption.

International literature on UPF consumption in children is scarce, especially in early childhood. However, an overview conducted to evaluate the UPF consumption among the pediatric population describes the prevalence in different countries. In low-and middle-income countries (Colombia, Mexico, and Chile) the participation of UPF in children's diet was around 18–35% of diet calories. While, in rich countries (United Kingdom, United States of America, and Canada) the participation was around 55–65% of diet calories (Khandpur et al., 2020).

Recent Brazilian studies have also found high UPFs consumption, above 70%, in early childhood (Giesta et al., 2019; Lopes et al., 2018). Data from the National Demography and Health Survey (DHS) 2006, showed that children from the South and Southeast regions more frequently consumed non-recommended foods, such as sweets and soft drinks (Bortolini et al., 2012). This fact is probably due to the greater development of the South, Southeast, and Midwest regions, allowing access to several types of food, including unhealthy ones.

The scientific literature has reported the understanding that UPFs contribute to more reduced food quality and health for individuals. Also, these products are formulated to induce frequent consumption or even to create addiction, and their intake becomes particularly critical early in life, as children are forming the basis of their eating habits.(BRASIL et al., 2019; Monteiro et al., 2019) The high prevalence of consumption of these foods, still in the early stages, is strongly related to the food marketing influence aimed at children and their caregivers. The industry focuses its efforts on generating the needs of this population to consume its products, relating them to aspects such as "superior nutritional quality", "convenience", "care", and "affectivity" (Giovanini & Sartori, 2013).

Regarding the food groups diversity, less than half of the children investigated had CF with the presence of the six recommended groups. A global database study described the low rate (28.2%) of children between six and 23 months of age receiving a minimally diverse diet to be of particular concern. (White et al., 2017) Research carried out with children under one year who live in the city of Barra Mansa/RJ, also showed a low CF food diversity (35.5%), considering the consumption of food groups (except for cereals or tubers), in the last 24 hours (Oliveira et al., 2017). Research conducted with data from DHS (2006) found lower prevalence, only about 20% of children aged 6 to 36 months consumed at least four of the recommended food groups, except for milk, every day in the week before the survey (Bortolini et al., 2015). This situation is no different in other countries. A recent research with data from demographic and health surveys of low and middle-income countries demonstrated that food diversity is low in most countries. Only four of the 49 countries assessed had a prevalence of minimum dietary diversity (consuming at least 5 of 8 groups in the last 24 hours) over 50% in children aged 6 to 23 months. The lowest prevalence was for the Sub-Saharan Africa region (18%) and the highest for the Latin America and Caribbean region (54%) (Baye & Kennedy, 2020).

It is important to reinforce the heterogeneity of the results presented by the studies, possibly due to the different methodologies used. They demonstrate that the CF practiced by most children does not present food diversity due to the absence of essential food groups to achieve the nutritional needs in this life stage.

This study also found that children in an unfavorable social and demographic situation had less food diversity compared to those in a better situation, corroborating the literature on the subject. Baye & Kennedy (2020) demonstrated that the proportions of food diversity increased according to the maternal level of education, income, and the degree of urbanization

in low and middle-income countries. White and collaborators (2017) emphasized that the minimum diet diversity rate among children in the wealthiest households was twice as that of children in the poorest households globally and three times that of Africa Sub-Saharan. Brazilian children living in the South, Southeast, and Center-West regions and with mothers with more than 12 years of education showed a greater food diversity compared to those in the North region with lower educated mothers (Bortolini et al., 2015). Study conducted with children zero to 72 months living in Pelotas/RS also show a significantly lower consumption of fruits and vegetables in children with lower family income (Karnopp et al., 2017).

It is essential to note the low prevalence of children who had a diversified diet and lack of UPFs. Brazilian food guide and global guidelines highlight a combination of both practices.(BRASIL et al., 2019) Another Brazilian population-based study highlighted a result like the one presented here. Only 3.4% of the investigated children consumed foods from all recommended groups, and did not consume foods rich in sugar, fat, and salt (Bortolini et al., 2015). Therefore, the need to discourage the consumption of unhealthy food became evident, together with the stimulus for the intake of in natura and minimally processed foods. In the first years of a child's life, the food variety influence the formation of taste and their relationship with food. The child who eats healthy and adequate food when young is more likely to become a conscious and autonomous adult person to make good food choices.(BRASIL et al., 2019) There are significant social and economic disparities in the nutritional quality of CF. Brazil and other countries, especially those with low and medium income still live with inequalities in access to food. There is still limited access to healthy and adequate food in certain parts of the country and the world (Baye & Kennedy, 2020; BRASIL et al., 2019; White et al., 2017) and the results of this research reinforced this affirmation. The nutritional adequacy score of the children's diet was also shown to be directly associated with the socio-demographic variables. Bortolini and collaborators (2015) also developed a score to assess the quality of food, showing that Brazilian children belonging to the most privileged socioeconomic class with a higher chance of having high-quality diets.

Dealing with disparities in the quality of child feeding can help to equate life opportunities for future generations. Inequalities in the nutritional quality of CF predispose children to anthropometric, dietary disorders, micronutrient deficiencies, poor health, and low productivity in adulthood and, therefore, can be at the center of socioeconomic and health inequalities (Schwartz et al., 2011; Steyn et al., 2006). It is essential to strengthen the infrastructure of the market and to increase the accessibility to various groups of food in rural regions and among populations economically vulnerable. The nutritional quality goals of the diet should be defined and monitored systematically to improve health and prevent all forms of malnutrition.

Among the limitations of this study, highlight the use of a closed questionnaire to assess food consumption, based on the last 24 hours. This method does not represent the child's usual intake, it does not differentiate atypical days of consumption; it depends on the interviewee's memory; and presents alternative responses that may include different foods, which may underestimate food consumption. Also, the data available limited the evaluation of other important aspects of the CF as starting age, the presence of food rich in essential nutrients for development, innocuousness, quantity and consistency of preparations, and frequency of meals.

With positive points, the importance of using data from a nationwide population survey is highlighted in the characterization of the CF nutritional adequacy for Brazilian children. Furthermore, this study evaluated two components of CF that have been little explored in the literature. It is worth mentioning that the use of a score composed of the indicators of food diversity and UPFs absence made it possible to assess CF nutritional adequacy offered to children according to their different socio-demographic profiles. Future studies could better understand how each aspect contributes to the CF practices in children to support better public policies and professionals' practices.

5. Conclusion

A large portion of Brazilian children aged between 6 to 24 months have inappropriate eating practices, evidenced by the high UPFs consumption and the low diversity of food groups. It is noteworthy that children with low socioeconomic status have higher degree of CF nutritional inadequacy compared to others, significantly marked by inequalities between the macro-regions and the country's census situation. In this view, it is necessary to develop government programs and policies that aim to reduce the disparities between communities. Similarly, government programs and policies that value the use of food and nutrition education strategies intend to encourage and show the benefits of a healthy and diverse, drawing attention to the consequences of high UPFs consumption at this stage.

References

Baye, K., & Kennedy, G. (2020). Estimates of dietary quality in infants and young children (6–23 mo): Evidence from demographic and health surveys of 49 low- and middle-income countries. Nutrition, 78, 110875. https://doi.org/10.1016/j.nut.2020.110875

Bortolini, G. A., Giugliani, E. R. J., Gubert, M. B., & Santos, L. M. P. (2019). Breastfeeding is associated with children's dietary diversity in Brazil. Ciencia e Saude Coletiva, 24(11), 4345–4354. https://doi.org/10.1590/1413-812320182411.29312017

Bortolini, G. A., Gubert, M. B., & Santos, L. M. P. (2012). Consumo alimentar entre crianças brasileiras com idade de 6 a 59 meses. Cadernos de Saude Publica, 28(9), 1759–1771. https://doi.org/10.1590/S0102-311X2012000900014

Bortolini, G. A., Vitolo, M. R., Gubert, M. B., & Santos, L. M. P. (2015). Iniquidades sociais influenciam a qualidade e a diversidade da dieta de crianças brasileiras de 6 a 36 meses. Cadernos de Saude Publica, 31(11), 2413–2424. https://doi.org/10.1590/0102-311X00153414

Brasil, Ministério da Saúde, Secretaria de Atenção à saúde, & Departamento de Atenção Básica. (2015). Orientações para a avaliação de marcadores de consumo alimentar na atenção básica.

Brasil, Ministério da Saúde, Secretaria de Atenção Primária à Saúde, & Departamento de Promoção à Saúde. (2019). Guia Alimentar Para Crianças Brasileiras Menores De 2 Anos.

Dallazen, C., da Silva, S. A., Gonçalves, V. S. S., Nilson, E. A. F., Crispim, S. P., Lang, R. M. F., Moreira, J. D., Tietzmann, D. C., & Vítolo, M. R. (2018). Introdução de alimentos não recomendados no primeiro ano de vida e fatores associados em crianças de baixo nível socioeconômico. Cadernos de Saude Publica, 34(2). https://doi.org/10.1590/0102-311x00202816

Giesta, J. M., Zoche, E., Corrêa, R. da S., & Bosa, V. L. (2019). Associated factors with early introduction of ultra-processed foods in feeding of children under two years old. Ciencia e Saude Coletiva, 24(7), 2387–2397. https://doi.org/10.1590/1413-81232018247.24162017

Giovanini, A., & Sartori, D. O. (2013). A influência do marketing aplicado à indústria de alimentos sobre o estado nutricional e o comportamento alimentar no Brasil. Segurança Alimentar e Nutricional, 20(2), 309–319.

Jaime, P. C., Frias, P. G. de, Monteiro, H. O. da C., Almeida, P. V. B., & Malta, D. C. (2016). 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., Recife, 16(2), 159–167. https://doi.org/10.1590/1806-93042016000200005

Karnopp, E. V. N., Vaz, J. dos S., Schafer, A. A., Muniz, L. C., Souza, R. de L. V. de, Santos, I. dos, Gigante, D. P., & Assunção, M. C. F. (2017). Consumo alimentar de crianças menores de seis anos conforme o grau de processamento. Jornal de Pediatria, 93(1), 70–78. https://doi.org/10.1016/j.jped.2016.04.007

Khandpur, N., Neri, D. A., Monteiro, C., Mazur, A., Frelut, M. L., Boyland, E., Weghuber, D., & Thivel, D. (2020). Ultra-Processed Food Consumption among the Paediatric Population: An Overview and Call to Action from the European Childhood Obesity Group. In Annals of Nutrition and Metabolism (Vol. 76, Issue 2, pp. 109–113). S. Karger AG. https://doi.org/10.1159/000507840

Lopes, W. C., Marques, F. K. S., Oliveira, C. F. de, Rodrigues, J. A., & Pinho, M. F. S. A. P. C. L. de. (2018). Alimentação de crianças nos primeiros dois anos de vida. Revista Paulista de Pediatria, 36(2), 164–170. https://doi.org/10.1590/1984-0462/;2018;36;2;00004

Monteiro, C. A., Cannon, G., Lawrence, M., Louzada, M. L. da C., & Machado, P. P. (2019). Ultra-processed foods, diet quality, and health using the NOVA classification system. FAO. http://www.wipo.int/amc/en/mediation/rules

Nicklaus, S. (2009). Development of food variety in children. Appetite, 52(1), 253–255. https://doi.org/10.1016/j.appet.2008.09.018

Obbagy, J. E., English, L. K., Psota, T. L., Wong, Y. P., Butte, N. F., Dewey, K. G., Fox, M. K., Greer, F. R., Krebs, N. F., Scanlon, K. S., & Stoody, E. E. (2019). Complementary feeding and micronutrient status: A systematic review. In American Journal of Clinical Nutrition (Vol. 109, pp. 852S-871S). https://doi.org/10.1093/ajcn/nqy266

Obbagy, J. E., English, L. K., Wong, Y. P., Butte, N. F., Dewey, K. G., Fleischer, D. M., Fox, M. K., Greer, F. R., Krebs, N. F., Scanlon, K. S., & Stoody, E. E. (2019). Complementary feeding and food allergy, atopic dermatitis/eczema, asthma, and allergic rhinitis: a systematic review. Am J Clin Nutr, 109, 890–934. https://doi.org/10.1093/ajcn/nqy220

Oliveira, M. I. C. de, Rigotti, R. R., & Cristiano Siqueira Boccolini. (2017). Fatores associados à falta de diversidade alimentar no segundo semestre de vida. Cadernos Saúde Coletiva, 25(1), 65–72. https://doi.org/10.1590/1414-462x201700010204

Oliveira, J. M., Castro, I. R. R. de, Silva, G. B. e, Venancio, S. I., & Saldiva, S. R. D. M. (2015). Avaliação da alimentação complementar nos dois primeiros anos de vida: proposta de indicadores e de instrumento. Cadernos de Saúde Pública, 31(2), 377–394. https://doi.org/10.1590/0102-311X00209513

Relvas, G. R. B., Buccini, G. dos S., & Venancio, S. I. (2019). Ultra-processed food consumption among infants in primary health care in a city of the metropolitan region of São Paulo, Brazil. Jornal de Pediatria, 95(5), 584–592. https://doi.org/10.1016/j.jped.2018.05.004

Rinaldi, A. E. M., & Conde, W. L. (2019). Socioeconomic inequality in dietary intake begins before 24 months in Brazilian children. Revista de Saude Publica, 53(1). https://doi.org/10.11606/S1518-8787.2019053000679

Roberto Borges de Souza-Júnior, P., Paulo Soares de Freitas, M., de Abreu Antonaci, G., & Landmann Szwarcwald, C. (2015). Desenho da amostra da Pesquisa Nacional de Saúde 2013 Sampling Design for the National Health Survey, Brazil 2013. Epidemiol. Serv. Saúde, 24(2), 207–216. https://doi.org/10.5123/S1679-49742015000200003

Saldiva, S. R. D. M., Venancio, S. I., de Santana, A. C., da Silva Castro, A. L., Escuder, M. M. L., & Giugliani, E. R. J. (2014). The consumption of unhealthy foods by Brazilian children is influenced by their mother's educational level. Nutrition Journal, 13(1). https://doi.org/10.1186/1475-2891-13-33

Schwartz, C., Scholtens, P. A. M. J., Lalanne, A., Weenen, H., & Nicklaus, S. (2011). Development of healthy eating habits early in life. Review of recent evidence and selected guidelines. Appetite, 57(3), 796–807. https://doi.org/10.1016/j.appet.2011.05.316

Sotero, A. M., Cabral, P. C., & Silva, G. A. P. da. (2015). Fatores socioeconômicos, culturais e demográficos maternos associados ao padrão alimentar de lactentes. Revista Paulista de Pediatria, 33(4), 445–452. https://doi.org/10.1016/j.rpped.2015.03.006

Steyn, N., Nel, J., Nantel, G., Kennedy, G., & Labadarios, D. (2006). Food variety and dietary diversity scores in children: are they good indicators of dietary adequacy? Public Health Nutrition, 9(5), 644–650. https://doi.org/10.1079/phn2005912

Taylor, R. W., Williams, S. M., Fangupo, L. J., Wheeler, B. J., Taylor, B. J., Daniels, L., Fleming, E. A., McArthur, J., Morison, B., Erickson, L. W., Davies, R. S., Bacchus, S., Cameron, S. L., & Heath, A.-L. M. (2017). Effect of a Baby-Led Weaning Approach to Complementary Feeding on Infant Growth and Overweight. Archives of Pediatrics & Adolescent Medicine (JAMA Pediatrics), 171(9), 838–846. https://doi.org/10.1001/jamapediatrics.2017.1284

United Nations Children's Fund (UNICEF). (2020). Improving young children's diets during the complementary feeding period. In UNICEF Programming Guidance. New. UNICEF.

White, J. M., Bégin, F., Kumapley, R., Murray, C., & Krasevec, J. (2017). Complementary feeding practices: Current global and regional estimates. Maternal and Child Nutrition, 13(S2), 1–12. https://doi.org/10.1111/mcn.12505

WHO. (2010). Indicators for assessing infant and young child feeding practices part 2: measurement. In World Health Organization. http://whqlibdoc.who.int/publications/2008/9789241596664_eng.pdf%5Cnhttp://www.unicef.org/programme/breastfeeding/innocenti.htm%5Cnhttp://innocenti15.net/declaration.pdf.pdf%5Cnhttp://whqlibdoc.who.int/publications/2010/9789241599757_eng.pdf