

## The food environment of Brazilian public and private schools

O ambiente alimentar das escolas públicas e privadas no Brasil

El ambiente alimentario de las escuelas públicas y privadas en Brasil

Ariene Silva do Carmo <sup>1</sup>  
Máira Macário de Assis <sup>1</sup>  
Cristiane de Freitas Cunha <sup>1</sup>  
Tatiana Resende Prado Rangel de Oliveira <sup>2</sup>  
Larissa Loures Mendes <sup>1</sup>

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### Abstract

*This study's aim was to characterize the food environment of Brazilian public and private schools. This was a national school-based cross-sectional study with 1,247 schools – among which 81.09% were public and 18.91% were private – in 124 Brazilian municipalities. The data originated from the Questionnaire on Aspects of the School Environment, used in the Study of Cardiovascular Risk in Adolescents (ERICA) in 2013 and 2014. Data analysis was conducted in 2017. The chi-square test was used to compare proportions. A greater proportion of public schools offered school meals (98.15%) in comparison to private schools (8.07%) ( $p < 0.001$ ). The internal sale of food and beverages was more prevalent in private schools (97.75% vs. 45.06%,  $p < 0.001$ ). Also, sale and advertisement of processed and ultra-processed foods (sodas, cookies, savory snacks, sandwiches and pizza), as well as the presence of vending machines for industrialized products (18.02% vs. 4%) ( $p < 0.001$ ) were more common in private schools. Street vendors at the school gate or surroundings were identified in 41.32% of the public schools and 47.75% of the private schools ( $p > 0.05$ ). These findings reveal the predominance of obesogenic environments mainly in private schools, and can contribute to the design of Brazilian public policies to promote a healthy school food environment.*

Feeding; Adolescent; Schools

### Correspondence

A. S. Carmo  
Escola de Enfermagem, Universidade Federal de Minas Gerais.  
Av. Prof. Alfredo Balena 190, Belo Horizonte, MG 30130-100,  
Brasil.  
arieneccarmo@gmail.com

<sup>1</sup> Escola de Enfermagem, Universidade Federal de Minas Gerais,  
Belo Horizonte, Brasil.

<sup>2</sup> Pontifícia Universidade Católica de Minas Gerais, Belo  
Horizonte, Brasil.



## Introduction

The increasing prevalence of chronic non-communicable diseases (NCD) such as hypertension, obesity, type 2 diabetes and cardiovascular diseases among adolescents has been associated with increased consumption of ultra-processed foods, combined with a sedentary lifestyle <sup>1,2,3</sup>. This condition results from the complex interaction of multiple factors, at various levels and contexts, including the individual, family, school, environment, community and public policies <sup>4</sup>.

The school environment is an important place to learn and gain experience related to children and adolescents' food intake. In this environment, the purchase and consumption of food occurs through cafeterias or school surroundings <sup>5</sup>. Thus, the school is considered a crucial place for carrying out activities related to health promotion and adequate nutrition <sup>6</sup>.

Ultra-processed foods are ready-to-eat products subjected to various industrial processing and numerous ingredients such as preservatives and stabilizers, sugar, sodium and/or fat. Examples of ultra-processed foods are sugar-sweetened beverages, confectioneries, stuffed biscuits, industrialized snacks, among others <sup>7</sup>. The offer and publicity of these foods in schools can encourage the adoption of inappropriate eating habits <sup>8</sup>.

According to studies previously conducted in American and Brazilian schools, children and adolescents who have easy access to fast-food cafeterias or food outlets (selling processed foods within walking distance of their schools) are more exposed to obesogenic eating environments <sup>5,9</sup>.

According to Swinburn et al. <sup>10</sup>, "obesogenic environments" are spaces that favor weight gain by stimulating the excessive consumption of unhealthy foods, or that lack infrastructure for leisure and physical activity. Such environments can induce the development of obesity, especially in individuals who have a genetic predisposition <sup>11</sup>. In this regard, school environments can be either obesogenic or leptogenic, depending on what is offered by their cafeterias and surroundings.

Considering the epidemic of obesity and the growing consumption of ultra-processed foods, the increasing sedentary lifestyle of children and adolescents, and the role played in these phenomena by schools' food environments, this study's goal was to characterize the food environment of Brazilian public and private schools.

## Methods

This research analyzed data from the national *Study on Cardiovascular Risks in Adolescents* (ERICA). The ethical procedures and criteria for data processing employed here were the same as the national study's. ERICA is a national, school-based, cross-sectional study aimed at estimating the prevalence of diabetes mellitus, obesity, cardiovascular risk factors, inflammatory markers, and insulin resistance in adolescents aged 12 to 17, enrolled in public and private schools in Brazilian cities with more than 100,000 inhabitants <sup>12</sup>. The study was approved by the Research Ethics Committees of its central coordinating institution (Institute of Public Health Studies/Federal University of Rio de Janeiro), and also by each Brazilian state.

Data collection occurred between March 2013 and December 2014. We evaluated 74,589 adolescents from 1,247 schools in 124 Brazilian municipalities. The population of the research was divided into 32 strata consisting of 27 capitals and five sets of municipalities with more than 100,000 inhabitants, in each of the country's five geographic macro-regions. For each geographic stratum, the schools were selected with probability proportional to size and inversely proportional to distance from the capital. The sample is representative of medium and large-sized municipalities (> 100,000 inhabitants) at the national and regional levels, and of the Brazilian capitals. The ERICA research protocol was described by Bloch et al. <sup>13</sup>.

Three separate questionnaires were used for data collection: one for students, one for parents or guardians, and another for the school personnel. The school questionnaire contained specific questions directed to the school board, in addition to questions about the school environment, which were answered by the field researcher through inspection of the school area.

In this article, only the data from the *Questionnaire on Aspects of the School Environment* were used: school meal offered, presence of food and beverage vending machines, presence of processed food

advertisements, presence of a well-structured cafeteria (a specific place, surrounded by walls and containing chairs and tables) inside the school premises, and presence of street vendors selling food and beverages in the school's surroundings. It should be noted that "surroundings" refer to the school's sidewalks. The sale of food and beverages – specifically some ultra-processed foods (sodas, biscuits, confectioneries, savory snacks, sandwiches, and pizza) – was evaluated according to the classification proposed by Monteiro et al. 7.

Data analysis was conducted in 2017, using Stata software version 13.0 (<https://www.stata.com>). Descriptive analysis involved calculating the relative frequency distribution and its corresponding 95% confidence interval (95%CI), and comparing proportions using the chi-square test. A significance level of 5% was adopted ( $p < 0.05$ ).

## Results

A total of 1,247 Brazilian schools were evaluated, among which 19% were in the North region, 30.4% in the Northeast, 23.4% in the Southeast, 12.9% in the South and 14.3% in the Central. Among the evaluated schools, 81.1% were public and 18.9% were private.

A higher proportion of public schools offered school meals (98.1%) compared to private schools (8%) ( $p < 0.001$ ). The presence of street vendors at the school gate or surroundings was identified in 58.6% of the public schools and 47.7% of the private schools. Approximately 60% of the public and private schools had well-structured cafeterias with no statistically significant differences between them ( $p > 0.05$ ) (Table 1).

In private schools, the sale of food and beverages in general (97.75% vs. 45.06%,  $p < 0.001$ ) was more prevalent as well as the presence of food and beverage vending machines (14.4% vs. 5.5%,  $p < 0.001$ ) in school premises. Also, the sale and advertisement of ultra-processed foods (sodas, biscuits, confectioneries, savory snacks, sandwiches and pizza) was more frequent (18% vs. 4.7%,  $p < 0.001$ ) (Table 1).

When the public schools were evaluated according to Brazilian regions, there was no prevalence difference in the offering of school meals regarding the type of region ( $p > 0.05$ ), while for other food environment characteristics, there was a difference among the regions ( $p < 0.05$ ). Vending machines for food and beverages were more frequent in the North region compared to the Northeast and South regions. The Northeast and South regions had the lowest prevalence of ultra-processed food advertisements in schools. The Northeast Region presented the lowest proportion of sale of food in schools in comparison to the other regions. Regarding the presence of a well-structured school cafeteria, the Southeast region had a higher proportion in comparison to all others, except for the South. Regarding the presence of street vendors at the school gate or surroundings, the North presented a higher proportion compared to the Southeast, South and Central regions (Table 2).

Regarding the evaluation of private schools according to region, there were no differences among the regions with respect to the provision of school meals, the presence of street vendors, the advertisement of ultra-processed foods and the sale of the majority of evaluated foods ( $p > 0.05$ ). The highest proportion of vending machines was found in the Northeast region in comparison to the South and Central regions. The sale of confectioneries was more frequent in the North and Northeast regions in comparison to the South and Southeast regions. Regarding the sale of sodas, the South region had the lowest proportion in comparison to all other regions, while the Northeast presented a higher proportion than the Southeast region. Well-structured cafeterias were more frequent in the South region compared to the Central region (Table 3).

## Discussion

These findings show that private Brazilian schools have a more obesogenic food environment than public schools, with a greater predominance of sales and advertisements of processed foods and beverages. The food environment of the public and private schools in the Northern region of the country was more obesogenic, while the private and public schools in the South as well as the public schools in the North had fewer obesogenic environments.

**Table 1**Characterization of food environment in Brazilian public and private schools. *Study of Cardiovascular Risk in Adolescents (ERICA)*, 2013-2014 (n = 1,247).

Variables	Public		Private		p-value *
	%	95%CI	%	95%CI	
Offers school meal	98.1	97.2-98.9	8.0	4.4-11.6	< 0.001
Has beverage and food vending machine	5.5	4.1-6.9	14.4	9.7-19.0	< 0.001
Sale of food in school	45.0	41.9-48.1	97.7	95.7-99.7	< 0.001
Sale of confectioneries in school	35.7	32.6-38.7	79.7	73.2-84.1	< 0.001
Sale of sweet biscuits and savory snacks in school	32.7	29.7-35.7	76.1	70.4-81.7	< 0.001
Sale of soda in school	34.9	31.9-37.9	75.2	69.5-80.9	< 0.001
Sale of fried or baked savory snacks	40.6	37.5-43.7	93.2	89.9-96.5	< 0.001
Sale of sandwiches in school	25.5	22.8-28.3	85.1	80.4-89.8	< 0.001
Sale of pizza in school	15.2	13.0-17.5	73.7	67.9-79.6	< 0.001
Presence of processed food advertisement	4.7	3.3-6.0	18.9	13.7-24.1	< 0.001
Presence of a well-structured cafeteria	59.6	56.5-62.7	54.0	47.4-60.6	0.125
Presence of street vendors at school gate or surroundings	58.6	55.5-61.7	47.7	45.6-58.8	0.081

95%CI: 95% confidence interval.

\* Chi-square test.

**Table 2**Characterization of food environment in public schools, according to Brazilian region. *Study of Cardiovascular Risk in Adolescents (ERICA)*, 2013-2014 (n = 1,012).

Variables	North		Northeast		Southeast		South		Central		p-value *
	%	95%CI	%	95%CI	%	95%CI	%	95%CI	%	95%CI	
Offers school meal	98.4	96.7-100.0	96.7	94.6-98.8	98.2	96.5-99.9	100.0	-	98.5	96.6-100.0	0.234
Has beverage and food vending machine	11.1	6.6-15.5	2.5	0.6-4.3	6.0	2.9-9.2	1.6	0.6-3.8	6.3	2.2-10.3	< 0.001
Sale of food in school	59.0	52.1-65.9	26.2	21.0-31.4	44.3	37.8-50.8	51.6	42.6-60.5	57.7	49.5-65.9	< 0.001
Sale of confectioneries in school	51.0	43.9-58.0	23.7	18.7-28.7	36.5	30.2-42.7	25.0	17.2-32.7	45.7	37.8-54.0	< 0.001
Sale of sweet biscuits and savory snacks in school	48.2	41.1-55.2	20.5	15.7-25.2	33.0	26.9-39.1	33.0	24.6-41.4	34.5	26.5-42.4	< 0.001
Sale of soda in school	50.5	43.4-57.5	23.0	18.0-28.0	35.2	28.9-41.4	25.0	17.2-32.7	45.0	36.7-53.3	< 0.001
Sale of fried or baked savory snacks in school	54.5	47.5-61.5	23.7	18.7-28.7	38.8	32.5-45.2	47.5	38.6-56.4	51.4	43.0-59.7	< 0.001
Sale of sandwiches in school	29.0	22.6-35.4	16.5	12.1-20.9	31.0	24.9-37.0	33.8	25.4-42.3	22.5	15.5-29.4	< 0.001
Sale of pizza in school	20.4	14.7-26.1	11.8	8.0-15.6	6.5	3.3-9.7	33.0	24.6-41.4	13.3	7.7-19.0	< 0.001
Presence of processed food advertisement in school	8.0	4.2-11.9	3.9	1.6-6.2	0.8	0.0-2.0	1.6	0.0-3.8	10.5	5.4-15.6	< 0.001
Presence of a well-structured cafeteria	56.0	49.0-73.0	48.2	42.2-54.1	83.4	78.6-88.3	77.4	69.9-84.8	33.1	25.2-40.9	< 0.001
Presence of street vendors at the gate and surroundings of the school	70.1	64.3-77.1	64.3	58.7-70.0	57.8	51.4-64.3	36.5	27.9-45.2	51.0	42.7-59.4	< 0.001

95%CI: 95% confidence interval.

\* Chi-square test.

**Table 3**

Characterization of food environment in private schools, according to Brazilian region. *Study of Cardiovascular Risk in Adolescents (ERICA)*, 2013-2014 (n = 236).

Variables	North		Northeast		Southeast		South		Central		p-value *
	%	95%CI	%	95%CI	%	95%CI	%	95%CI	%	95%CI	
Offers school meal	4.0	0.0-12.2	5.8	0.7-10.8	9.8	1.3-18.2	23.0	5.7-40.4	2.8	0.0-8.6	0.032
Has beverage and food vending machine	20.0	3.8-36.8	23.5	14.3-32.7	7.8	0.2-15.4	3.8	0.0-11.76	5.7	0.0-13.8	0.013
Sale of food in school	100.0	-	98.8	96.4-100.0	94.1	87.4-100.0	100.0	-	97.1	91.3-100.0	0.316
Sale of confectioneries in school	88.0	74.3-100.0	90.4	84.0-96.8	70.5	57.6-83.5	50.0	29.4-70.5	77.1	62.5-91.7	< 0.001
Sale of sweet biscuits and savory snacks in school	76.0	58.0-93.9	83.5	75.4-91.5	76.4	64.4-88.5	73.0	54.8-91.3	60.0	42.9-77.0	0.103
Sale of soda in school	92.0	80.5-100.0	89.4	82.7-96.0	68.6	55.4-81.8	30.7	11.7-49.7	71.4	55.6-87.1	< 0.001
Sale of fried or baked savory snacks in school	100.0	-	94.1	89.0-99.0	92.1	84.5-99.7	92.3	81.3-100.0	88.5	77.4-99.6	0.515
Sale of sandwiches in school	92.0	80.5-100.0	87.0	79.7-94.3	90.2	81.7-98.6	80.7	64.5-97.0	71.4	55.6-87.1	0.099
Sale of pizza in school	80.0	63.1-96.8	78.5	69.6-87.5	70.6	57.6-83.5	76.9	59.5-94.2	60.0	42.9-77.0	0.255
Presence of processed food advertisement in school	32.0	12.3-51.6	23.5	14.3-32.7	13.7	3.9-23.5	0.0	-	20.0	0.6-33.9	0.027
Presence of a well-structured cafeteria	44.0	23.0-64.0	60.0	49.3-70.6	50.9	36.7-65.1	73.0	54.8-91.3	37.1	20.3-53.9	0.037
Presence of street vendors at the gate and surroundings of the school	56.0	35.0-76.9	48.2	37.3-59.0	56.8	42.7-70.9	34.6	15.0-54.2	65.7	49.1-82.2	0.141

95%CI: 95% confidence interval.

\* Chi-square test.

Almost all Brazilian public schools offer school meals, with no difference among the regions. This is due to the Brazilian National School Feeding Program (PNAE)<sup>14</sup>, implemented in 1955 with the aim of contributing to the growth, development, learning, school performance of students, and the development of healthy eating habits, through the provision of school meals and nutritional education interventions. Currently, PNAE serves all basic education students (kindergarten, elementary school, high school and Youth and Adult education) enrolled in public, philanthropic schools and community entities (affiliated to public authority) through the transfer of financial resources.

According to the current PNAE legislation, priority is given to fresh and minimally processed foods. Thirty percent of all the resources destined to PNAE must be used in the purchase of products from family-based farms and the menu must offer three portions of fruits and vegetables per week (200g/student/week). On the other hand, ultra-processed products such as canned foods, sausages, beverages with low nutritional value and sweets are prohibited or restricted in the school menu<sup>15</sup>.

Thus, the provision of school meals in public schools, coupled with lower sales and advertisement of processed foods in school premises, can generate a healthier food environment and lead to better food consumption among students. Some Brazilian studies have evidenced the benefits of school meals offered in Brazilian public schools for healthy eating practices. A study conducted in 2015, with a representative national sample of Brazilian adolescents, found lower consumption of sugar, sugar-sweetened beverages, processed and ultra-processed foods among students in public schools compared to private schools<sup>16</sup>. Another study conducted with 1,357 public school students from a

capital city in the Southeast region of Brazil revealed that children who consumed 2 or 3 daily school meals had a 7.3% higher intake of fresh foods, and a 10.5% higher intake of minimally processed foods. They also had a 18% and 26% lower consumption of ultra-processed foods when compared to children who did not consume school meals <sup>17</sup>.

With regard to the sale of processed foods and beverages in school premises, *Interministerial Ordinance n. 1,010/2006* <sup>18</sup> establishes guidelines for the Promotion of Healthy Eating in Brazilian public and private schools at the primary, middle and high school levels. It also supervises the restriction of sales and commercial promotion in school food environments, and limits the preparation of foods with high levels of saturated fats, trans fats, free sugars and salts, encouraging the consumption of fruits, legumes and vegetables. However, almost all private schools and approximately one-third of the public schools evaluated sell processed foods and beverages in school premises. It should be noted that, despite the ordinance's guidance, there is no mechanism put in place to monitor and supervise the commerce of processed foods and beverages.

Until March 2013 (when data collection for this study commenced), 10 of the 26 Brazilian states had some kind of legal provision (ordinance, resolution, decree or law) concerning the sale of food in the school environment: 1 in the North Region (7 states) <sup>19</sup>, none in the Northeast (9 states), 2 in the Central (3 states) <sup>20,21</sup>, 4 in the Southeast (4 states) <sup>22,23,24,25</sup> and 3 in the South (3 states) <sup>26,27,28</sup>. Among these, 4 applied only to public schools and the rest applied to both public and private schools, which explains the results of this study, showing a higher proportion of private schools selling ultra-processed foods in the school environment in comparison to public schools.

Furthermore, according to a study conducted by the Brazilian Ministry of Health in order to identify and analyze experiences in the regulation of food sales in the school environment, the presence of the PNAE in public schools facilitates adherence to these regulations, since the students are given an alternative to the cafeteria. As reported by the study, it is noteworthy that, in the public school system, the system tends to comply with the regulation, as it is legitimized by a higher court. This differs greatly from the reality of private schools, where there is a greater resistance to law enforcement and a lack of understanding concerning the school environment being a public space for interaction and learning of health habits. Furthermore, some factors were observed that may hinder adherence to the regulation of cafeterias as well as their adequate inspection, such as the degree of complexity of the law, specifications that lack clarity and objectivity, or incoherence regarding permitted and prohibited foods <sup>29</sup>.

In 2015-2016, four additional state laws were established in order to restrict the commerce of processed foods and beverages in the school environment. One applied to the North <sup>30</sup>, 2 to the Northeast <sup>31,32</sup> and 1 to the Federal District (Brazil's capital) <sup>33,34</sup>. They all applied to public and private schools. It is worth pointing out that, while the legislation is certainly moving forward, a national law is still needed for clearer regulation aimed at restricting the trade and propaganda of all ultra-processed foods in the premises of public and private schools, besides greater supervision and enforcement of the law. Nutritional education and the offering of healthier meals in schools have also been suggested as important measures to facilitate healthier food choices <sup>29</sup>.

The restriction of the commerce and advertising of these foods in the school space is crucial, since the excessive consumption of ultra-processed products is directly associated with metabolic syndrome among adolescents <sup>3</sup>, and also with obesity at all ages <sup>35</sup>.

Regarding the sale of food and beverage at the gates and surroundings of schools, a high prevalence of this practice was observed. In recent years there have been major changes in the food environment around schools, facilitating the consumption of food outside the home and increasing access to cheap and highly caloric foods <sup>36</sup>. A study conducted in New Zealand showed that the food environment in the surroundings of schools, even with a small effect size, can influence adolescents' dietary quality <sup>37</sup>. Another study, carried out in the United States, highlighted that food from street vendors near schools was a significant part of students' energy intake <sup>38</sup>. All the above points to the importance of public policies that regulate the commerce of food in the surroundings of schools. Currently, however, Brazilian legal provisions on this subject are still scarce. In 2015, the Brazilian capital implemented a decree to forbid the sale of foods that are markers of unhealthy diet in a 50-meter radius of schools <sup>34</sup>.

With regard to the presence of advertisements for ultra-processed foods in school premises, this practice was more frequent in private schools. Several studies have quantified children and adoles-

cents' exposure to advertisements, finding that increased exposure to unhealthy food advertisements leads to increased intake of unhealthy food<sup>39,40,41</sup>. A study conducted in the United States showed that adolescents with high susceptibility to advertisements were more likely to consume at least one sugar-sweetened beverage per day (OR = 1.73; 95%CI: 1.21-2.47). There was a direct association between attraction to advertised foods and purchasing the product ( $p < 0.001$ ) in children and adolescents from a private school in Brazil<sup>40</sup>. Thus, policies aimed at restricting the presence of advertisements for ultra-processed foods in school environments are of the utmost importance for the promotion of healthy food choices among adolescents. In May 2010, member states of the World Health Organization (WHO) approved a Set of Recommendations on Marketing of Foods and Non-Alcoholic Beverages for Children, which had as one of its recommendations the restriction of exposure to advertising of unhealthy foods in the school environment<sup>42</sup>.

Finally, it is worth emphasizing that obesogenic environments such as the ones found in this study, especially in the case of private schools, may lead to less-healthy eating choices and, consequently, the development of obesity. Ecological models suggest that childhood obesity is the result of a complex series of factors that operate at multiple levels, from the individual to the family and school contexts, also involving the influence of public policies, the community and the environment<sup>4</sup>. Similarly, Davison et al.<sup>43</sup> propose that infant and juvenile nutritional status is determined by the interaction of variables at multiple levels, including risk factors and characteristics of the children, parenting styles and family, as well as community, demographic and social characteristics. In the latter, the authors include school feeding programs, accessibility to food establishments in the community, and school environment. In this sense, international agreements such as the Global Strategy for Healthy Eating, Physical Activity and Health, by the WHO<sup>44,45</sup>, as well as national policies such as the Strategic Action Plan for Tackling Chronic Non-Communicable Diseases<sup>46</sup> and the Intersectoral Strategy for the Prevention and Control of Obesity<sup>47</sup> have made recommendations aimed at promoting a favorable environment for healthy food choices, with emphasis on institutionalized spaces such as schools.

The present study has as a limitation the non-adjustment of sample weight in its analysis, since the sampling was designed to represent the data on adolescents, not schools. Another limitation of the study lies in the fact that it did not approach the socioeconomic profile of the students and of the territories in which the public and private schools are located, considering that evidence suggests a relationship between the characteristics of the food environments, the population's socioeconomic conditions, and the territory's economic characteristics<sup>48,49</sup>. However, the subject of this study is highly relevant, since the characterization of food intake at the national level can help in the design of federal public policies that facilitate healthier food choices.

## Conclusion

The prevalence of the sale of ultra-processed foods and the presence of street vendors in the surroundings of the schools were high, and in general, private schools presented a more obesogenic food environment than public schools. Considering the schools by geographic region, the food environment was more obesogenic in the public and private schools of the North Region, and less obesogenic in the public and private schools of the South region as well as in the public schools of the Northeast Region.

Such findings may contribute to the design of more efficient public policies aimed at making the school environment a place for health promotion, providing adequate and healthy food to Brazilian children and adolescents.

## Contributors

A. S. Carmo and M. M. Assis were responsible for the analysis and interpretation of the data and writing of the manuscript. T. R. P. R. Oliveira contributed to the research and data collection, writing of the manuscript and critical review of content. C. F. Cunha and L. L. Mendes critically reviewed the manuscript.

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## Resumo

O estudo teve como objetivo caracterizar o ambiente alimentar das escolas públicas e privadas no Brasil. Este foi um estudo transversal nacional de base escolar com 1.247 escolas (81,09% públicas e 18,91% privadas) em 124 municípios brasileiros. Os dados foram obtidos do Questionário sobre Aspectos do Ambiente Escolar utilizado no Estudo de Riscos Cardiovasculares em Adolescentes (ERICA) em 2013 e 2014. Os dados foram analisados em 2017. O teste do qui-quadrado foi usado para comparar as proporções. Proporcionalmente mais escolas públicas ofereciam refeições escolares (98,15%), em comparação com as escolas privadas (8,07%) ( $p < 0,001$ ). A venda de alimentos e bebidas no ambiente escolar interno era mais prevalente nas escolas privadas (97,75% vs. 45,06%,  $p < 0,001$ ). Além disso, a propaganda e venda de alimentos processados e ultra-processados (refrigerantes, biscoitos, salgadinhos, sanduíches e pizza) também eram mais comuns nas escolas privadas, assim como, a presença de máquinas de autoatendimento com venda de produtos industrializados (18,02% vs. 4%) ( $p < 0,001$ ). Os vendedores ambulantes no portão ou nos arredores da escola foram identificados em 41,32% das escolas públicas e 47,75% das escolas privadas ( $p > 0,05$ ). Os achados revelam a predominância de ambientes obesogênicos, especialmente nas escolas privadas, e podem contribuir para a elaboração de políticas públicas brasileiras para promover um ambiente alimentar saudável nas escolas.

Alimentação; Adolescente; Instituições Acadêmicas

## Resumen

El objetivo de este estudio fue caracterizar el ambiente alimentario de las escuelas públicas y privadas en Brasil. Se trata de un estudio transversal nacional con base escolar, en 1.247 escuelas (81,09% públicas y 18,91% privadas), de 124 municipios brasileños. Los datos se obtuvieron del Cuestionario sobre Aspectos del Ambiente Escolar, utilizado en el Estudio de Riesgos Cardiovasculares en Adolescentes (ERICA) en 2013 y 2014. Los datos fueron analizados en 2017. El test de chi-cuadrado se usó para comparar las proporciones. Proporcionalmente, más escuelas públicas ofrecían comidas escolares (98,15%), en comparación con las escuelas privadas (8,07%) ( $p < 0,001$ ). La venta de alimentos y bebidas en el ambiente interno escolar era más prevalente en las escuelas privadas (97,75% vs. 45,06%,  $p < 0,001$ ). Además, la propaganda y venta de alimentos procesados y ultraprocesados (refrescos, galletas, aperitivos, sándwiches y pizza) también eran más comunes en las escuelas privadas, así como la presencia de máquinas de autoservicio con venta de productos industrializados (18,02% vs. 4%) ( $p < 0,001$ ). Los vendedores ambulantes a la puerta de la escuela o en los alrededores de la escuela fueron identificados en un 41,32% de las escuelas públicas y 47,75% de las escuelas privadas ( $p > 0,05$ ). Los hallazgos revelan la predominancia de ambientes obesogênicos, especialmente en las escuelas privadas, y pueden contribuir a la elaboración de políticas públicas brasileñas para promover un ambiente alimentario saludable en las escuelas.

Alimentación; Adolescente; Instituciones Acadêmicas

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