Score of ultra-processed food consumption and its association with sociodemographic factors in the *Brazilian National Health Survey*, 2019

Escore de consumo de alimentos ultraprocessados e sua associação com fatores sociodemográficos na *Pesquisa Nacional de Saúde*, 2019

Puntuación para el consumo de comida ultraprocesada y su asociación con factores sociodemográficos en la *Encuesta Nacional de Salud*, 2019

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Abstract

This is a cross-sectional population-based study that describes the score of ultra-processed food consumption, applied in the Brazilian National Health Survey *performed in 2019, and its association with sociodemographic factors in Brazilian adults (18 years or older). The score of ultra-processed food consumption was calculated by adding up the positive answers about the consumption on the previous day of 10 subgroups of ultra-processed foods frequently consumed in Brazil. The distribution of the score in the population was presented as a count. Poisson regression models were used to evaluate the crude and adjusted associations of scores equal to or higher than five subgroups of ultra-processed foods with urban/rural area, geographic region, sex, age group, schooling level, and wealth index. About 15% of the Brazilian adults reached scores equal to or higher than five. After adjustment for confounders, the prevalence of consuming five or more subgroups of ultra-processed foods decreased linearly with age, increased linearly with wealth quintiles and it was higher in urban areas, in the Southeast and South regions (compared to the others) and in men. Public policies that reduce the consumption of ultra-processed foods with emphasis on strata of the population at the greatest risk are essential and monitoring the score of ultra-processed food consumption across studies and populations will be important to assess the success of these policies.*

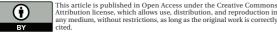*Food Consumption; Diet Surveys; Industrialized Food; Adult; Methods*

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Introduction

Ultra-processed foods, according to the NOVA classification, are industrial formulations of processed food substances (oils, fats, sugars, starch, protein isolates) that contain little or no whole food and typically include flavorings, colorings, emulsifiers, and other cosmetic additives [1]. These foods are usually low-cost and highly profitable to the transnational food corporations and extremely palatable, convenient to use, and liable to displace all other NOVA food groups (unprocessed, minimally processed, and processed) and the culinary preparations made with these foods [1].

From 2009 to 2019, volume sales of ultra-processed foods per capita increased worldwide, including in Latin America and the Caribbean [2]. In Brazil, ultra-processed foods sales (kg per capita) presented an annual growth rate of 1.9% in the same period [2]. According to national food purchasing surveys, the contribution of ultra-processed foods to the total energy acquired by Brazilian household consumers increased from 12.6% to 16% and 18.4% from 2002/2003 to 2008/2009 and 2017/2018, respectively [3]. In 2017/2018, ultra-processed foods represented about 20% of the total energy consumed by Brazilian adolescents and adults [4].

Food consumption surveys conducted in representative samples of several countries, including Brazil, show that the consumption of ultra-processed foods – measured as the percentage of total energy intake – is strongly associated with a nutrient profile that increases the risk of noncommunicable chronic diseases (NCDs) [5,6,7,8,9,10]. Large cohort studies conducted in different countries have confirmed that increased dietary contribution of ultra-processed foods is associated with a higher risk of several NCDs and all-cause mortality [11,12,13,14,15,16,17,18]. However, the data collection instruments used to assess ultra-processed food consumption in the aforementioned studies (24-hour food recalls, food records, and food frequency questionnaires) are time- and resource-consuming, hampering the estimation and monitoring of the dietary contribution of ultra-processed foods in many populations.

To monitor the consumption of ultra-processed foods in the Brazilian adult population, some of the authors of the present study developed a short instrument for Vigitel (*Risk and Protective Factors Surveillance System for Chronic Non-Communicable Diseases Through Telephone Interview*), a national annual telephone surveillance system of risk factors for non-communicable diseases. This tool evaluates the consumption on the previous day (yes or no) of a list of 13 subgroups of ultra-processed foods, selected from the most consumed foods in Brazil according to data from the *Brazilian Household Budget Survey* 2008-2009 (POF) and allows for the estimation of a score of ultra-processed food consumption, as the number of subgroups consumed on the previous day, varying from 0 to 13 [19]. The Vigitel system, which covers the adult population living in the capitals cities of the 27 Brazilian states, estimated that one in five adults consumed five or more subgroups of ultra-processed foods in 2019 [19,20].

In the same year, the *Brazilian National Health Survey* (PNS) collected data on the consumption of ultra-processed foods based on a set of 10 questions similar to the ones applied by the Vigitel study. This study aims to describe the score of ultra-processed food consumption and evaluate its association with sociodemographic factors in the Brazilian adult population assessed by the PNS in 2019.

Methods

Study design and participants

This cross-sectional population-based study was performed using data from the second edition of the PNS, conducted in 2019, by the Brazilian Institute of Geography and Statistics (IBGE) in partnership with the Brazilian Ministry of Health [21].

The PNS, which had its first edition in 2013, is a nationwide household survey, representative of residents of permanent private households, belonging to urban and rural areas, of the five major Brazilian regions, distributed in the 26 Federative Units and the Federal District. It main aim is to evaluate, at every 5 years, the performance of the national health system and the living and health conditions of the Brazilian population. The survey also monitors the evolution of health outcomes and subsidizes the planning and evaluation of public health policies for the Brazilian Unified National Health System (SUS) [21,22].

Sampling and data collection procedure

The sampling process was performed in three stages. Firstly, the primary sampling units (PSU) were randomly selected. The PSU were composed of the Census Sectors or set of sectors from the Master Sample of the Integrated System of Household Surveys (SIPD) of the IBGE. In the second stage, a fixed number of permanent private households was selected by simple random sampling from each PSU selected in the first stage, ranging from 12 to 18 households depending on the Brazilian state. Finally, by simple random sampling, the third stage units were selected, composed of one resident aged 15 years and over from each selected household, who answered the questionnaire [21,22].

The questionnaire consisted of 24 different modules, including general information about the household and its residents, as well as specific questions to the selected resident about work characteristics and social support, perceived health status, accidents, lifestyles, noncommunicable disease, women's health, prenatal care, oral health, paternity, and prenatal care. Also, questions about violence, communicable diseases, sexual activities, working relationships and conditions, and medical care were answered only by residents aged 18 years or over [21,22]. For this study, only data about residents aged 18 years and over and from the Module P were evaluated, which included a list of 10 questions used to investigate the consumption of specific subgroups of ultra-processed foods in the previous day, as well as sociodemographic characteristics

After obtaining an informed consent form from the selected residents, trained fieldworkers performed the data collection at the households from August 2019 to March 2020. Mobile Collection Devices (smartphones) programmed with the survey questionnaire were used (IBGE, 2020). The 2019 edition was approved in August 2019 by the Brazilian National Ethics Research Committee (opinion n. 3,529,376).

Detailed methods regarding sampling procedure, weighting factors, data collection, and collection instruments are available in the official publications of the results and in the PNS 2019 methodological article [21,22].

Score of ultra-processed food consumption

The 2019 edition of the PNS included a module for assessing the consumption of ultra-processed foods from a list of 10 items, similar to the one applied by the Vigitel study. In both surveys, the questionnaires were built to include the subgroups of ultra-processed foods with the greatest participation in the daily energy intake estimated by the *Brazilian Dietary Survey* performed in the POF 2008-2009 conducted by the IBGE. In the PNS 2019, respondents answered "yes" or "no" to the following questions: "Yesterday, did you drink or eat: (1) Soft drink?; (2) Fruit juice drink in can or box or prepared from a powdered mix?; (3) Chocolate powder drink or flavored yogurt?; (4) Packaged salty snacks or crackers?; (5) Sandwich cookies or sweet biscuits or packaged cake?; (6) Ice cream, chocolate, gelatin, flan or other industrialized dessert?; (7) Sausage, mortadella or ham?; (8) Loaf, hot dog or hamburger bun?; (9) Margarine, mayonnaise, ketchup or other industrialized sauces?; (10) Instant noodles, instant powdered soup, frozen lasagna or other frozen ready-to-eat meal?" [21]. The PNS replicated the list of 13 subgroups proposed for Vigitel but turning six items (three most similar pairs) into three, without excluding any item. The consumption of fruit juice drink in can or box was investigated with fruit juice drink prepared from powdered mix, chocolate powder drink with flavored yogurt, and margarine with mayonnaise, ketchup or other industrialized sauces.

The score of ultra-processed food consumption of each participant was calculated by adding up the positive answers given to these questions regarding consumption on the day prior to the interview, which can vary from 0 to 10 points.

Sociodemographic factors

The sociodemographic variables included in this study were: area of residence (urban and rural), geographic region (North, Northeast, Central-West, Southeast, and South), sex (male and female), age (18-29, 30-39, 40-49, 50-59, and 60 years and over), schooling (none, incomplete elementary school, complete elementary school, complete high school, and complete higher education), and wealth index.

The last one was built based on principal component analysis considering data about the number of rooms and bathrooms in the household, sewage type, assets (color television, refrigerator, washing machine, landline, mobile phone, microwave, computer, motorcycle, Internet access, and number of cars), and existence of monthly maid/domestic employee. The wealth index was categorized into quintiles.

Data analysis

Initially, the sample was described according to the sociodemographic variables. The frequencies (%) of consumption of each selected subgroup of ultra-processed foods on the previous day were described, with their respective 95% confidence intervals (95%CI). The distribution of the score of ultra-processed food consumption was used as a count. To assess the association between the score of ultra-processed food consumption and sociodemographic variables, the score was dichotomized into the upper fifth (approximate) of the distribution, corresponding to scores greater than or equal to five. Poisson regression models were used to assess the association between the sociodemographic factors and the outcome, estimating crude and adjusted prevalence ratios (PR) and their respective 95%CI. In the multiple regression models, the sociodemographic variables were adjusted for each other.

The microdata was obtained from the IBGE website for PNS and all analyses were performed using the Stata statistical package, version 16.1 (https://www.stata.com) using the *svy* command, which computes standard errors by using the linearized variance estimator, and the expansion factors or sample weights.

Results

The analytical sample of this study included 88,531 Brazilian adults. Participants were more likely to dwell in urban areas and in the Southeast Region, female and with complete high school. The mean age was 44.9 years old (Table 1).

Figure 1 describes the frequency of consumption for each subgroup of ultra-processed foods on the day prior to the interview. Almost half of the sample reported having consumed margarine, mayonnaise, ketchup, or other industrialized sauces (45.9%), and about one-third of the participants reported having consumed soft drink (32.9%) and loaf, hot dog or hamburger bun (31%). Between 20% and 30% of the sample reported having consumed sausage, mortadella, or ham (27.2%), fruit juice drink in can or box or prepared from a powdered mix (24.3%), sandwich cookies or sweet biscuits or packaged cake (23.8%) and packaged salty snacks or crackers (23.3%). Less than 20% of the individuals reported consuming food from each of the three remaining subgroups on the day prior to the interview (ice cream, chocolate, gelatin, flan, or other industrialized dessert; chocolate powder drink or flavored yogurt; instant noodles, instant powdered soup, frozen lasagna, or other frozen ready-to-eat meal).

Figure 2 shows the distribution of the score of ultra-processed food consumption, which is equivalent to the number of subgroups consumed on the day prior to the interview. Scores ranged from 0 to 10, but one (19.9%), two (21%), three (17.6%) and four (12.5%) were the most common; 14.8% of participants reached null scores and 14.3% achieved scores equal to or higher than five. In average, the sample reported having consumed 2.49 (95%CI: 2.47-2.52) subgroups of ultra-processed foods on the day prior to the interview (data not shown).

Table 2 presents the crude and adjusted relationship between sociodemographic variables and scores for the consumption of ultra-processed foods equal to or higher than five. After adjustment for confounders, individuals living in urban areas presented a prevalence of scores for the consumption of ultra-processed foods ≥ 5 66% higher than individuals living in rural areas. This prevalence was lower in the Northeast, increasing about 30% in the North and Central-West, 66% in the Southeast and 108% in the South. Men presented prevalence of the indicator 17% higher than women (PR = 1.17; 95%CI: 1.10-1.24). Prevalence of scores equal to or higher than five decreased linearly with age and increased linearly with wealth index quintiles. Schooling was no longer associated with scores of ultra-processed food consumption equal to or higher than five after adjustment for confounders (Table 2).

Table 1

Sample distribution according to sociodemographic characteristics. Brazilian adult population (18 years or older). *Brazilian National Health Survey*, 2019 (N = 88,531).

Characteristicc	% (95%CI)
Area	
Rural	13.8 (13.4-14.2)
Urban	86.2 (85.8-86.6)
Geographic region	
Northeast	26.5 (25.9-27.0)
North	7.8 (7.6-8.1)
Southeast	43.4 (42.6-44.2)
South	14.7 (14.3-15.1)
Central-West	7.6 (7.3-7.9)
Sex	
Female	53.2 (52.6-53.8)
Male	46.8 (46.2-47.4)
Age (years)	
18-29	22.1 (21.6-22.7)
30-39	21.0 (20.5-21.5)
40-49	18.2 (17.7-18.6)
50-59	17.1 (16.7-17.5)
60+	21.6 (21.1-22.2)
Age (mean) *	44.9 (44.7-45.2)
Schooling level	
None	6.4 (6.1-6.6)
Incomplete elementary school	28.4 (27.8-29.0)
Complete elementary school	14.5 (14.1-14.9)
Complete high school	35.5 (34.9-36.2)
Complete higher education	15.2 (14.6-15.9)
Wealth index (quintile)	
1st (poorest)	13.6 (13.2-14.0)
2nd	17.1 (16.6-17.5)
3rd	20.4 (19.9-20.9)
4th	23.7 (23.2-24.3)
5th (richest)	25.2 (24.4-26.0)

95%CI: 95% confidence interval.

* Sample weights were considered to calculate the estimates.

Discussion

The inclusion in the PNS 2019 of questions about the intake of commonly consumed subgroups of ultra-processed foods has allowed the calculation of a score of ultra-processed food consumption, as the number of subgroups consumed on the previous day, varying from 0 to 10. Margarine or industrialized sauces, soft drink, packaged bread, sausages, industrialized fruit juice, and salty or sweet cookies were the subgroups most frequently consumed. About 15% of the Brazilian adults reached scores equal to or higher than five subgroups of ultra-processed foods. After adjustment for confounders, the prevalence of five or more subgroups of ultra-processed foods decreased linearly with age and increased linearly with wealth index quintiles and was lower in rural areas, in the Northeast Region, and among women.

Figure 1

Frequency (%) of consumption of selected subgroups of ultra-processed foods on the day prior to the interview. Brazilian adult population (18 years or older). *Brazilian National Health Survey*, 2019 (N = 88,531).
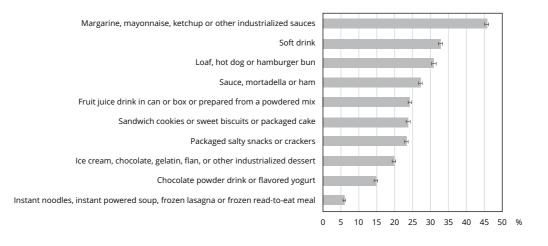

Figure 2

Distribution of the score of ultra-processed food consumption. Brazilian adult population (18 years or older). *Brazilian National Health Survey*, 2019 (N = 88,531).
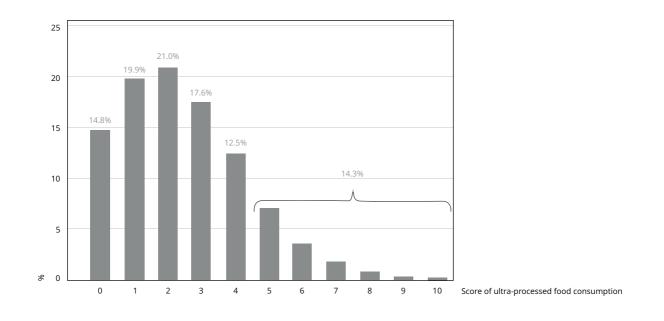
Table 2

Crude and adjusted association between sociodemographic characteristics and scores for the consumption of ultra-processed foods equal to or higher than five. Brazilian adult population (18 years or older). *Brazilian National Health Survey*, 2019 (N = 88,531).

Characteristic	Score of ultra-processed food consumption ≥ 5		
	% (95%CI)	Crude PR (95% CI)	Adjusted * PR (95% CI)
Area			
Rural	7.4 (6.8-8.1)	1.00	1.00
Urban	15.4 (14.9-15.9)	2.08 (1.90-2.28) **	1.66 (1.51-1.82) **
Geographic region			
Northeast	8.8 (8.3-9.3)	1.00	1.00
North	12.0 (11.1-13.0)	1.36 (1.24-1.50) [a]	1.26 (1.15-1.38) [a]
Southeast	16.4 (15.5-17.3)	1.86 (1.72-2.01)	1.66 (1.54-1.80)
South	19.9 (18.9-21.0)	2.26 (2.09-2.45)	2.08 (1.92-2.26)
Central-West	13.1 (12.0-14.3)	1.49 (1.35-1.65) **,[a]	1.30 (1.18-1.44) **,[a]
Sex			
Female	13.1 (12.5-13.7)	1.00	1.00
Male	15.7 (15.0-16.4)	1.20 (1.13-1.28) **	1.17 (1.10-1.24) **
Age (years)			
18-29	23.0 (21.8-24.3)	1.00	1.00
30-39	17.7 (16.7-18.8)	0.77 (0.71-0.83)	0.79 (0.72-0.85)
40-49	12.8 (11.8-13.8)	0.56 (0.50-0.61)	0.58 (0.53-0.65)
50-59	9.6 (8.8-10.4)	0.42 (0.38-0.46)	0.44 (0.39-0.49)
60+	7.1 (6.5-7.8)	0.31 (0.28-0.34) ***	0.35 (0.31-0.39) ***
Schooling level			
None	6.3 (4.9-8.2)	1.00	1.00
Incomplete elementary school	9.0 (8.4-9.6)	1.42 (1.09-1.85)	0.98 (0.75-1.29) [a]
Complete elementary school	17.6 (16.4-18.9)	2.78 (2.12-3.65)	1.33 (0.99-1.76) [b]
Complete high school	18.6 (17.8-19.5)	2.94 (2.26-3.82)	1.27 (0.96-1.69) [b]
Complete higher education	14.3 (13.3-15.4)	2.26 (1.72-2.96) ***	1.05 (0.78-1.41) [a]
Wealth index (quintile)			
1st (poorest)	8.2 (7.5-9.0)	1.00	1.00
2nd	11.8 (11.0-12.6)	1.43 (1.28-1.60)	1.07 (0.95-1.19)
3rd	14.9 (13.9-16.0)	1.81 (1.62-2.03)	1.19 (1.04-1.35)
4th	16.6 (15.6-17.7)	2.02 (1.81-2.25)	1.21 (1.07-1.38)
5th (richest)	16.6 (15.5-17.7)	2.01 (1.80-2.24) ***	1.21 (1.06-1.38) ***

95%CI: 95% confidence interval; PR: prevalence ratio.

Notes: sample weights were considered to calculate the estimates. Categories sharing a letter in the group label are not significantly different at 5% level.

* Sociodemographic variables were adjusted for each other by Poisson regression model;

** p-value < 0.01;

*** p-value for linear trend < 0.01.

The three subgroups most frequently consumed in the PNS 2019 were the same indicated by the Vigitel survey in the same year (margarine, soft drink, and packaged bread). The distribution of the score of ultra-processed food consumption (as a count) was also similar in the two surveys. However, the prevalence of consuming five or more subgroups of ultra-processed foods in the day prior to the interview was higher in the Vigitel survey (18.2, 95%CI: 17.4-19.0 vs. 14.3, 95%CI: 13.8-14.8) [19]. This variation could be explained by the different number of subgroups of ultra-processed foods included in the questionnaire of each survey, 13 for the Vigitel and 10 for PNS 2019 (six of the 13 subgroups in the Vigitel questionnaire were turned into three in the PNS questionnaire). However, the main reason for this discrepancy could be that the Vigitel sample is representative only of the population living in

the capitals, where the consumption of ultra-processed foods is higher compared to non-capitals, and the PNS is representative of all national territory, including urban and rural areas. This difference in the prevalence does not make unfeasible the main objective of both Vigitel and PNS tools, which is the monitoring the consumption of ultra-processed foods in the population.

As in our study, the prevalence of consumption of five or more subgroups of ultra-processed foods (out of 13 subgroups) in the Vigitel survey linearly decreased with age and was lower among women [19]. On the other hand, while in this study no association was observed with schooling level and a positive association was observed with quintiles of wealth, in the Vigitel survey schooling level was inversely associated with ultra-processed food consumption. This result was observed possibly due to the lack of adjustment for wealth index or another socioeconomic variable. In the Vigitel survey, schooling was used as a proxy or indicator of socioeconomic level. In fact, schooling and wealth index could reflect different aspects and other studies are necessary to confirm the relationship between schooling and consumption of ultra-processed foods, when adjusting for wealth index, for example.

Nationally representative cross-sectional studies performed in several countries have unanimously observed an inverse association between the dietary contribution of ultra-processed foods (as % of total energy intake) and age while the association with sex and income/education varied across countries [6,23,24,25,26,27]. While in Canada and the United Kingdom the consumption of ultra-processed food was higher among men, in Chile consumption was higher among women and in the United States, Mexico and Colombia no differences were observed across sexes. Similar to what we observed in this study, Chile, Mexico, and Colombia also described a positive association between ultra-processed food consumption and income, while Canada and the United States observed an inverse association. These inconsistent results were found possibly due to differences in socioeconomic variables and other variables considered in the models used in these studies or even to differences in the mechanisms that, in each country, mediate sex and socioeconomic level to the consumption of ultra-processed foods.

This study has some limitations. As most methods of evaluating food consumption, the information from this questionnaire was self-reported, and a possibility of recall bias was identified. Also, the score of ultra-processed food consumption represents a proxy of the percentage of energy contribution from ultra-processed foods and does not refer to complete data on the consumption of these foods. However, we emphasize that a validation study conducted in 2018 with a convenience sample in the city of São Paulo (Brazil), showed good agreement (kappa coefficient: 0.72) between fifths of the score for consumption of ultra-processed foods (measured by a questionnaire identical to that used in Vigitel) and fifths of the contribution of ultra-processed foods to the total daily energy intake (measured by 24-hour food record), both calculated based on the previous day food consumption [28]. This study evaluated the performance of the 13-item questionnaire and not the PNS adapted list of 10 subgroups; however, we do not believe that the agreement would not be similar. A second validation study, performed as part of the *NutriNet Brasil Cohort Study* (*NutriNet Brasil*, https://nutrinetbrasil.fsp. usp.br/), confirm the good agreement between the score of ultra-processed food consumption (with 23 subgroups, adapted to be self-filled using the Internet) and the contribution of ultra-processed foods to total energy intake [29].

This study follows other studies that have been applying screeners to monitor the consumption of ultra-processed foods in a quick and practical manner. Besides the Vigitel study and the *NutriNet Brasil*, a set of questions about the consumption of ultra-processed foods was also applied in the *Brazilian National Survey of School Health* (PeNSE), 2019/2020 edition [30], then estimates will also include the adolescent school population. Also, the NOVA Screener for the consumption of ultra-processed foods, the tool developed for the *NutriNet Brasil*, is currently under adaptation to be used in Ecuador, India, and Senegal, which has been encouraging other countries to incorporate short questionnaires within national surveillance and monitoring and evaluation systems to broaden the assessment of ultra-processed foods in the populations.

Considering the evidence that demonstrates the harmful effect of ultra-processed food consumption on diet quality and on the risk of several chronic non-communicable diseases, public policies that reduce the consumption of those ultra-processed foods and the emphasis on strata of the population at greatest risk are essential. Monitoring the score of ultra-processed food consumption across studies and populations will be important to assess the success of these policies.

Contributors

Additional informations

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Resumo

Estudo transversal de base populacional com objetivo de descrever o escore de consumo de alimentos ultraprocessados, avaliado na Pesquisa Nacional de Saúde *em 2019, e sua associação com fatores sociodemográficos em adultos brasileiros (com 18 anos ou mais). O escore de consumo de alimentos ultraprocessados foi calculado, somando as respostas positivas a perguntas sobre o consumo no dia anterior de dez subgrupos de alimentos ultraprocessados, consumidos frequentemente no Brasil. A distribuição da pontuação na população foi apresentada na forma de contagem. Foram utilizados modelos de regressão de Poisson para avaliar as associações brutas e ajustadas para pontuações iguais ou maiores de subgrupos de ultraprocessados, de acordo com situação (urbana/rural), macrorregião, sexo, grupo etário, escolaridade e índice de riqueza. Cerca de 15% dos adultos brasileiros obtiveram pontuações iguais ou superiores a cinco. Após ajustar para fatores de confusão, a prevalência do consumo de cinco ou mais subgrupos de ultraprocessados diminuiu de maneira linear com a idade, aumentou de maneira linear com os quintis de renda e foi mais alta nas áreas urbanas, nas regiões Sul e Sudeste e em homens. São necessárias políticas públicas que reduzam o consumo de alimentos ultraprocessados, com ênfase nos segmentos da população com maior risco. Para avaliar o sucesso dessas políticas, será importante monitorar os níveis de consumo de ultraprocessados entre os diversos estudos e populações.*

Consumo de Alimentos; Inquéritos sobre Dietas; Alimentos Industrializados; Adulto; Métodos

Resumen

El objetivo de este estudio transversal, de base poblacional, es describir la puntuación para el consumo de comida ultraprocesada y su asociación con factores sociodemográficos en adultos brasileños (con 18 años de edad o más). Los datos proceden de la Encuesta Nacional de Salud *llevada a cabo en 2019. La puntuación para el consumo de comida ultraprocesada se calculó sumando las respuestas positivas a preguntas sobre el consumo el día previo de 10 subgrupos de comidas ultraprocesadas frecuentemente consumidas en Brasil. La distribución de la puntuación en la población se presentó como un dato de conteo. Fueron utilizados modelos de regressioón de Poison para evaluar las asociaciones crudas y ajustadas de puntuaciones iguales a o superiores a cinco subgrupos de comidas ultraprocesadas con áreas urbanas/rurales, región geográfica, sexo, grupo de edad, nivel de escolaridad, e índice de riqueza. Alrededor de un 15% de los adultos brasileños alcanzaron puntuaciones iguales o mayores que cinco. Tras el ajuste para los factores de confusión, la prevalencia del consumo de cinco o más subgrupos de comidas ultraprocesadas decreció, aumentando linealmente con los quintiles de riqueza y era superior en las áreas urbanas, en las regiones Sur y Sudeste (comparadas con las otras) y en hombres. Son necesarias políticas públicas para reducir el consumo de comidas ultraprocesadas con enfásis en los estratos poblacionales en mayor riesgo. Monitorear la puntuación del consumo de comida ultraprocesada a través de estudios y poblaciones será importante para evaluar el éxito de estas políticas.*

Consumo de Alimentos; Encuestas sobre Dietas; Alimentos Industrializados; Adulto; Métodos