

Consumption of food markers of a healthy diet according to racial groups of women in Brazil

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Abstract *This article aims to analyze the consumption of healthy food consumption markers, according to racial groups of Brazilian women interviewed in the 2019 National Health Survey (NHS). This work was a cross-sectional study with data from 45,148 white and black women, aged ≥ 20 years. The variables used were the consumption of fruits, vegetables and legumes, beans, and fish. The association between color/race and the dietary intake indicators was tested using crude Poisson regression and adjusted to estimate prevalence ratios and 95% confidence intervals (95%CI). The prevalence of the consumption of fruits and vegetables was statistically higher among white women, while fish and beans was higher among black women. After adjusting for socioeconomic and demographic variables, it was found that black women remained only less likely to consume fruit (PR = 0.91; 95% CI: 0.88-0.95) and only more likely to consume beans (PR = 1.07; 95% CI: 1.04-1.10) than whites. There were racial inequalities for the consumption of healthy foods among Brazilian women, indicating that color/race defined a dietary pattern for black women that put them in vulnerable conditions in terms of fruit consumption.*

Key words *Women, Health of ethnic minorities, Food consumption*

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Introduction

Adequate and healthy eating has a protective role against Noncommunicable Diseases (NCDs), and promotes a greater quality of life and wellbeing. However, food consumption varies between racial groups of men and women. Around the world, there is an important debate about the determinants of eating habits and how inequalities associated with this food consumption can affect the living and health conditions of population groups. In Brazil, the National Health Promotion Policy (*Política Nacional de Promoção da Saúde* – PNPS) proposes the human right to adequate and healthy food as one of its priority themes, as a means of guaranteeing one's quality of life, thereby reducing poverty and promoting a greater social inclusion^{1,2}.

In recent years, the Brazilian population has experienced several socioeconomic, demographic, epidemiological, and cultural changes that have resulted in changes in their health patterns and food consumption. Conversely, nutritional problems coexist and overlap in Brazil, such as food insecurity, overweight, and obesity^{3,4}.

The Ministry of Health points out that a total of 12,776,938 Brazilian adults monitored in Primary Health Care (PHC), by the Food and Nutrition Surveillance System (*Sistema de Vigilância Alimentar e Nutricional* – SISVAN) in 2019, 63% were overweight and 28.5% were obese. However, the frequency of obesity in women is higher than in men, 61.4% and 63.2% respectively⁵. In the black population, these data are no different, data from the 2018 Surveillance of Risk and Protective Factors for Chronic Diseases by Telephone Survey (*Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico* – Vigitel) indicate that the percentage of black adults who are overweight is 56.5% (57.3% among men and 55.8% among women) and 20% for obesity (21.8% among women and 18.1% among men)⁶. The main reason for the increasing prevalence of obesity and overweight in the world is the inability of food systems to provide healthy diets⁷.

As a result, there is a higher prevalence of NCDs in the black population, which indicates that risk factors are distributed differently according to color/race⁸. The black population practices less physical activity during leisure time and consumes less fruit and vegetables, which can be explained by lower income, less food availability, less opportunity, and less access to produced goods. On the other hand, they consume more

foods that may have a greater relationship with local eating habits and a production or acquisition capacity, for example: beans and fish⁹.

Color/race can positively or negatively influence people's eating patterns¹⁰. Racial inequalities in health in Brazil are deeply rooted; black and brown people have major disadvantages when compared to white people in different health-related outcomes¹¹⁻¹³. In this sense, understanding color/race as one of the Social Determinants of Health (SDOH) presents a broader view in relation to the health-disease process, as it is related to other factors, including living conditions, socio-community wellbeing, income distribution, working conditions, social support networks, among others¹⁴.

Racial inequalities lead to less access to educational, socioeconomic, community, occupational resources and land, and consequently less social mobility. Most black people live in more economically segregated neighborhoods, where they are deprived of access to, commercialization of, and acquisition of healthy foods, coupled with less social and political capital, as well as less access to health services and guidance. They are also more commonly exposed to exhausting, unprofitable, and more stressful work¹¹.

In Brazil, approximately half of the black population is represented by women. These suffer double discrimination: racism and sexism. Gender and racial discrimination interact and accumulate throughout life cycles, defining less healthy behaviors in black women when compared to white women¹⁵. All of these exposures restrict life and work options in less healthy environments, associated with greater adherence to risky behaviors that increase the risk of excess weight and a sedentary lifestyle, together with their associated problems¹⁶.

However, few studies have analyzed racial inequalities in the food consumption of Brazilian women at a national level according to socioeconomic, demographic, and state variables. Thus, the National Health Survey (NHS) represents an important source of data, as it enables the establishment of consistent measures of healthy eating for both white and black women, thus aiding in the implementation of more effective public policies throughout the country¹⁷.

Therefore, the present study sought to analyze healthy food consumption markers (beans, fish, fruits, and vegetables) according to the racial groups of Brazilian women interviewed in the 2019 NHS.

Methods

Type of study

This is a cross-sectional study based on secondary data collected by the NHS, conducted in 2019. This data was used to analyze the consumption of beans, fish, fruits, vegetables, and legumes among Brazilian women.

The National Health Survey (NHS)

The NHS was conducted in 2019 by the Brazilian Institute of Geography and Statistics (IBGE) in partnership with the Ministry of Health (MS) and the Oswaldo Cruz Foundation (Fiocruz)¹⁷. This is a population-based household survey, conducted nationwide, seeking to obtain valid and representative information from the Brazilian population on a wide range of life and health measures.

The sampling used was probabilistic by means of conglomerates in three stages of selection, with stratification of the Basic Health Units (BHUs). The households represent the secondary units, while the tertiary unit represents the resident, aged ≥ 15 years, selected from each household based on the list of residents who respond to the individual part of the questionnaire applied by NHS 2019. The census sectors or set of sectors were initially selected by probability proportional to size for the Master Sample, and through an equally proportional probability for the NHS, households and residents were selected by simple random sampling^{17,18}.

Interviews were carried out in 94,115 households, in which 279,382 residents responded to the part of the questionnaire that was common for all individuals. By contrast, the questionnaire modules aimed at the specific resident, aged ≥ 15 years, were answered by a total of 94,115 people. However, for the analyses of the present study, only women ≥ 20 years of age, of white, brown, and black color/race were considered⁶. Thus, the final sample consisted of 45,148 individuals. Data collection took place between August 2019 and March 2020. Further methodological details can be obtained in NHS publications^{17,18}.

Outcome and independent variables

For this research, the socioeconomic, demographic, and health covariates were: female gender; age (in completed years); color/race (white, black (brown plus black); marital status (married,

divorced, widow, single); education (in levels, up to incomplete elementary school or equivalent, incomplete high school or equivalent, incomplete higher education or equivalent, complete higher education); income level (up to 1/2 minimum wage (MW), 1/2 up to 1 MW, 1 to 2 MW, 2 to 3 MW, more than 3 MW); per capita household income quintile [in five strata: 1st (lowest), 2nd, 3rd, 4th, and 5th (highest)], with the median income in the 1st quintile being R\$236.00, while in the 5th quintile it was greater than or equal to R\$3,133.00; location of residence (urban, rural); macro-region of residence in five categories (North, Northeast, Midwest, Southeast, and South); location within the Brazilian state (capital, metropolitan region excluding capital, Interior); 26 states and the Federal District; possession of a private health plan (yes, no); number of residents in the household (grouped into three categories: 1, 2, and ≥ 3 people).

The following indicators of healthy eating were considered to be outcomes: recommended fruit consumption (on five or more days per week); vegetables (five or more days a week); regular consumption of beans (five or more days a week) and fish (at least once a week). The foods were chosen because they present a protective factor against the occurrence of overweight and obesity, as well as NCDs¹⁹.

Data analysis

The prevalence and their 95% confidence intervals (95% CI) of food consumption indicators by white and black color/race were estimated according to socioeconomic, demographic, and state variables. Differences in the distribution of frequencies of the estimated variables were considered statistically significant at the 5% level in the absence of any overlapping 95% CI.

Crude and adjusted Poisson regression analyses with robust variance were performed to estimate Prevalence Ratios (PR) and respective 95%CI for the association of race with each food consumption outcome.

All analyses were performed using the RStudio software, version 2022.2.3.492 (R Foundation for Statistical Computing, Boston, United States of America) and incorporate all of the characteristics of the NHS 2019 complex sampling plan.

Ethical aspects

The NHS 2019 data are of public domain and can be used according to the research of interest.

The 2019 NHS project was previously approved by the National Research Ethics Commission (CONEP)/National Health Council (CNS) under opinion no. 3.529.37617.

Results

In this study, data from 45,148 women (≥ 20 years) were evaluated, with a median age of 44 (32-58) years and a predominance of black women (55.3%; 95%CI: 54.4-56.2).

Figure 1 shows the prevalence of healthy food consumption markers in the total population of women and their racial groups. In the total population, the consumption of vegetables was more prevalent, while fish consumption was lower. The consumption of fruits and vegetables was statistically higher among white women, while the consumption of fish and beans was statistically higher among black women. In all categories, fish was the least consumed food (Figure 1).

Figure 2 shows the prevalence of healthy food consumption markers among adult women ac-

ording to the Brazilian states. Statistically significant differences were observed in the greater consumption of vegetables among white women in the states of Maranhão and Mato Grosso, Espírito Santo, São Paulo, and Rio Grande do Sul. In relation to fruit consumption, a statistically significant prevalence among white women in the states of Pernambuco, Piauí, Mato Grosso do Sul, and in all states in the southeast and south regions of Brazil (Figure 2).

Figure 3 shows the prevalence of healthy food consumption markers of beans and fish among adult women according to the Brazilian states. The consumption of beans was found to be more prevalent among black women and was statistically significant for the states of Alagoas, Mato Grosso, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Rio Grande do Sul, and Santa Catarina. The highest consumption of fish was found among black women, which was statistically significant in the state of Amazonas for white women, and reached the highest levels in Paraná.

Most food consumption markers were low among younger people, regardless of race/col-

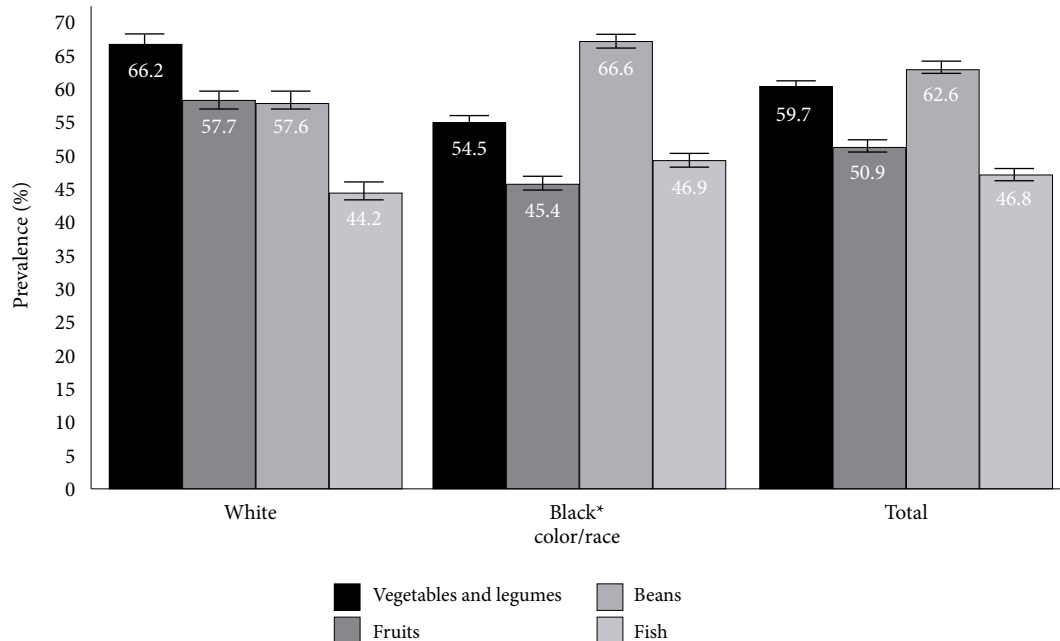


Figure 1. Prevalence of healthy food consumption markers among adult women (≥ 20 years of age), according to color/race and according to data from the 2019 NHS ($n = 45,148$), Brazil.

*Black refers to the combined categories of black and brown color/race.

Source: Brazil, NHS 2019.

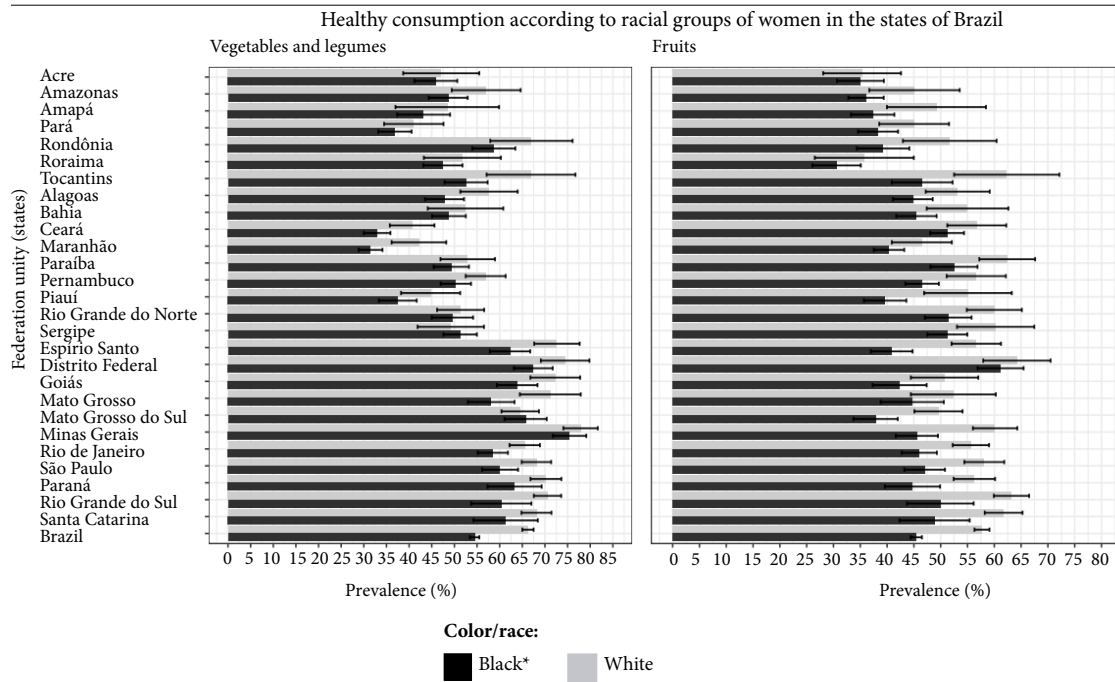


Figure 2. Prevalence of indicators of healthy food consumption markers among adult women according to Brazilian states, interviewed in the 2019 NHS (n = 45,148), Brazil.

*Black refers to the combined categories of black and brown color/race.

Source: Brazil, NHS 2019.

or. It is important to note that in the age group over 60 years of age, white women consumed more vegetables (71.8%, 95%CI: 69.9-73.7), fruits (70.1%, 95%CI 68.1-72.1), while among black women, the consumption of beans (70.3%, 95%CI 68.4-72.1) and fish (70.3%, 95%CI 68.4-72.1) were more prevalent.

Women who live alone tend to consume more vegetables, fruits, and fish than those who live with several people. White women who live alone eat more vegetables and fruits than do black women, while black women consume more beans and fish than do white women. In all racial groups, the highest proportion of healthy food consumption markers was among women with the highest educational levels and in the highest income quintile. The exception is the consumption of beans, which increased inversely proportional to these two factors: the lower the level of education and income, the greater the consumption. However, once again, black women consumed less vegetables and fruits and more beans and fish than did white women.

The Midwest region showed a higher prevalence of the consumption of vegetables (71.0%, 95%CI 68.1-73.9) and beans (51%, 95%CI 49.4-52.7) for white women. However, among black women, these items were consumed more in the Southeast region (64.3%, 95%CI 62.1-66.5, vegetables and 72.5%; 95%CI 70.5-74.4 for beans). Regarding the food consumption of fish, the North region showed the highest prevalence, which was higher among black women (75.5%, 95%CI 73.6-77.3) than among white women (69.7%, 95%CI 65.9-73.5).

Regarding the location of housing in the State, white women living in the capital and metropolitan region showed a higher consumption of fruits (60.8%, 95%CI 59.2-62.5) and fish (51.0%, 95%CI 49.4-52.7). For black women, the highest consumption in this region was vegetables (54.8%, 95%CI 53.4-56.1), fruits (49%, 95%CI 47.6-50.4), and fish (53%, 95%CI 51.6-54.4). However, it was observed that white women, regardless of the type of city of residence in Brazil, consumed more fruits and vegetables, while black women

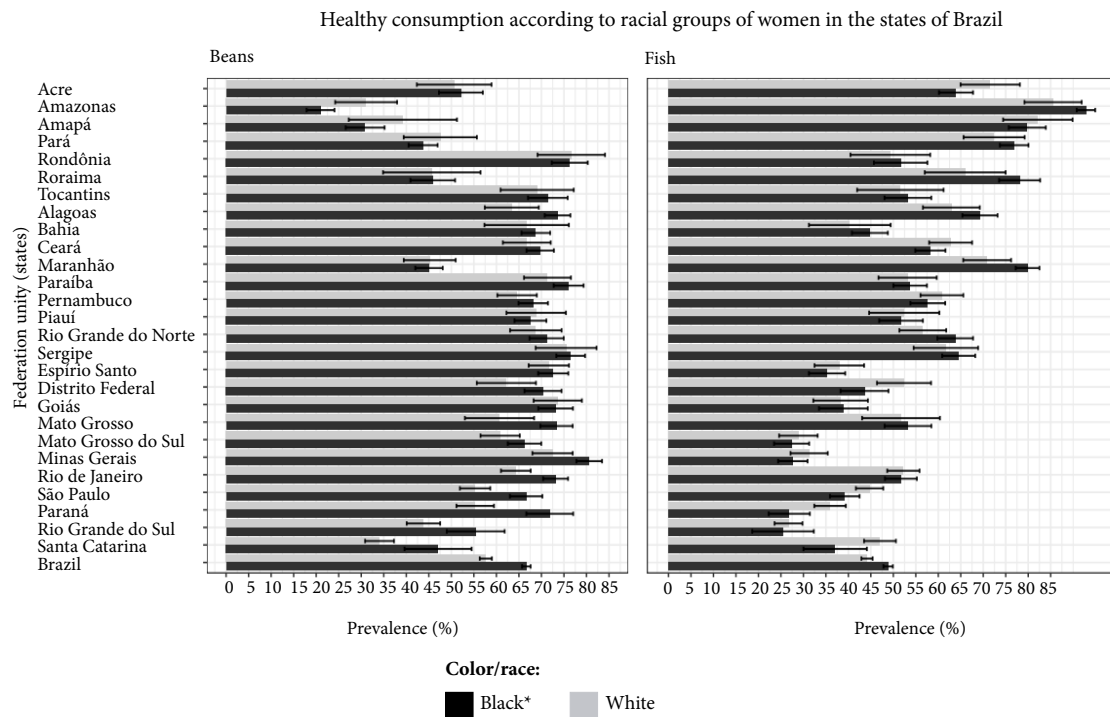


Figure 3. Prevalence of healthy food consumption markers among adult women, according to color/race, interviewed in the 2019 NHS (n = 45,148), Brazil.

*Black refers to the combined categories of black and brown color/race.

Source: Brazil, NHS 2019.

only consumed more beans (Table 1).

Table 2 shows the PR and 95%CI for the Poisson regression. In the crude association, black women consume 18% (95%CI 0.80-0.85) less vegetables and 21% (95%CI 0.76-0.81) less fruit when compared to white women. On the other hand, black women had a 16% higher prevalence of the consumption of beans (95%CI 1.13-1.19) and an 11% (95%CI 1.07-1.15) higher prevalence of fish consumption than white women. After adjusting for socioeconomic and demographic variables (age group, number of residents, education, per capita income quintile, regions of the country, and location of the city of residence), the association of black women with fruit consumption continued to be negative (9%, 95%CI: 0.88-0.95), while the consumption of beans (7%, 95%CI 1.04-1.10) continued to be positive when compared to white women (Table 2).

Discussion

The results of this study reveal racial inequal-

ities in food consumption among black and white women across the country. White women showed a higher consumption of vegetables, legumes, and fruits, while black women presented a more prevalent consumption of beans and fish. Differences in this consumption pattern were verified between Brazilian states and socioeconomic and demographic characteristics of the women analyzed in this study. However, after the adjusted regression analysis, the results showed that black women continued to consume less fruit and more beans than white women.

Studies conducted in Brazil and other countries confirm that the quality of one's diet tends to be better in the white population, influenced by increased income and/or education, and that diets with a high energy content and a low nutritional quality are more commonly consumed by vulnerable groups, such as the black population, who tend to opt for less healthy foods due to the price, the satiety they provide, the ease of access, and the level of knowledge they have about the

Table 1. Prevalence of healthy food consumption markers by color/race according to socioeconomic and demographic variables of adult women interviewed in the 2019 NHS (n = 45,148), Brazil.

| Variables | Whites (n = 16.979) | | | | | | | | Blacks* (n = 28.169) | | | | | | | |
|---|------------------------|-------------|--------|-------------|-------|-------------|------|-------------|------------------------|-------------|--------|-------------|-------|-------------|------|-------------|
| | Vegetables and Legumes | | Fruits | | Beans | | Fish | | Vegetables and Legumes | | Fruits | | Beans | | Fish | |
| | % | 95%CI | % | 95%CI | % | 95%CI | % | 95%CI | % | 95%CI | % | 95%CI | % | 95%CI | % | 95%CI |
| Age range in years | | | | | | | | | | | | | | | | |
| 20 to 29 | 50,7 | (47.1-54.2) | 39.6 | (36.3-43.0) | 55.5 | (51.8-59.2) | 37.9 | (34.6-41.3) | 43.4 | (40 -46.1) | 33.9 | (31.7-36.2) | 62.6 | (60.0-65.2) | 41.4 | (38.9-43.9) |
| 30 to 39 | 65.7 | (62.8-68.5) | 51.0 | (47.6-54.4) | 53.7 | (51.0-56.4) | 41,8 | (39.1-44.5) | 53.2 | (51.2-55.2) | 40.5 | (38.5-42.6) | 64.5 | (62.5-66.6) | 47.1 | (44.9-49.2) |
| 40 to 49 | 65.1 | (61.7-68.6) | 55.5 | (52.1-58.8) | 56.9 | (53.7-60.1) | 43,1 | (40.1-46.2) | 57.3 | (55.1-59.6) | 45.6 | (43.4-47.8) | 66.7 | (64.6-68.9) | 51.2 | (48.9-53.6) |
| 50 to 59 | 73.0 | (70.6-75.4) | 64.0 | (61.3-66.7) | 57.6 | (54.7-60.5) | 46.6 | (44.0-49.3) | 58.5 | (56.2-60.9) | 51.6 | (49.3-54.0) | 69.7 | (67.6-71.7) | 54.3 | (52.0-56.7) |
| ≥60 | 71.8 | (69.9-73.7) | 70.1 | (68.1-72.1) | 62.2 | (60.1-64.3) | 48.5 | (46.3-50.7) | 60.2 | (58.2-62.1) | 56.4 | (54.4-58.4) | 70.3 | (68.4-72.1) | 51.1 | (49.0-53.3) |
| Family household | | | | | | | | | | | | | | | | |
| One | 69.3 | (66.9-71.8) | 69.3 | (66.9-71.7) | 48.7 | (46.1-51.3) | 46.4 | (43.8-49.1) | 59.4 | (57.2-61.6) | 54.9 | (52.4-57.3) | 61.1 | (58.8-63.3) | 50.2 | (47.7-52.7) |
| Two | 69.2 | (67.3-71.2) | 62.2 | (60.1-64.4) | 53.2 | (51.0-55.4) | 46.7 | (44.6-48.8) | 58.7 | (56.8-60.5) | 49.9 | (47.9-51.9) | 64.7 | (62.9-66.5) | 48.5 | (46.6-50.5) |
| Three or more | 64.5 | (62.8-66.2) | 54.0 | (52.3-55.8) | 60.9 | (59.2-62.6) | 42.8 | (41.1-44.4) | 52.7 | (51.3-54.0) | 43.1 | (41.8-44.4) | 67.8 | (66.6-69.0) | 48.8 | (47.5-50.1) |
| Education | | | | | | | | | | | | | | | | |
| Up to incomplete elementary or equivalent | 61,9 | (59.6-64.2) | 54.2 | (51.9-56.5) | 69.4 | (67.2-71.6) | 40.6 | (38.5-42.8) | 51.6 | (50.0-53.2) | 42.1 | (40.6-43.7) | 72.4 | (71.1-73.8) | 48.9 | (47.2-50.5) |
| Incomplete high school or equivalent | 65.3 | (61.8-68.8) | 55.3 | (51.6-59.0) | 61.7 | (58.1-65.3) | 39.5 | (35.9-43.0) | 52.3 | (49.5-55.1) | 42.2 | (39.5-44.9) | 69.0 | (66.5-71.6) | 46.5 | (43.8-49.3) |
| Incomplete higher education or equivalent | 64.0 | (61.9-66.1) | 53.7 | (51.3-56.1) | 57.9 | (55.6-60.2) | 42.9 | (40.7-45.2) | 53.9 | (52.0-55.7) | 45.3 | (43.5-47.1) | 64.0 | (62.1-65.8) | 47.1 | (45.3-48.9) |
| Complete higher education | 74.9 | (72.7-77.2) | 68.3 | (66.0-70.6) | 41.5 | (38.9-44.1) | 52.2 | (49.7-54.7) | 68.2 | (65.8-70.7) | 60.3 | (57.5-63.1) | 52.7 | (49.9-55.4) | 56.6 | (53.9-59.4) |

it continues

health impact attributed to the inclusion of these items in their diet^{20,21}. A study that compared the eating patterns of white and black Americans showed that the eating pattern based on processed meat, fried foods, refined grains, sugar, margarine, sweets, and fats was more common among black people^{22,23}.

Data from the Ministry of Health confirm a high consumption of fruits and vegetables in the white as compared to the black population. Vital research reveals that while 39% of white people consume these foods at least five days a week,

the percentage is only 29% in the black population. Moreover, the low consumption of fresh foods is a risk factor for several chronic diseases⁶.

Healthy eating patterns of women in this study increased with age, especially those over 50 years of age. This fact may be associated with the culture of greater care for health and food quality among older women, who historically occupy a social role as caregivers and are generally responsible for the selection and preparation of food, which can contribute to a greater care with one's own diet²⁰. Another hypothesis is that,

Table 1. Prevalence of healthy food consumption markers by color/race according to socioeconomic and demographic variables of adult women interviewed in the 2019 NHS (n = 45,148), Brazil.

| Variables | Whites (n = 16.979) | | | | | | | | Blacks* (n = 28.169) | | | | | | | |
|--|------------------------|-------------|--------|-------------|-------|-------------|------|-------------|------------------------|-------------|--------|-------------|-------|-------------|------|-------------|
| | Vegetables and Legumes | | Fruits | | Beans | | Fish | | Vegetables and Legumes | | Fruits | | Beans | | Fish | |
| | % | 95%CI | % | 95%CI | % | 95%CI | % | 95%CI | % | 95%CI | % | 95%CI | % | 95%CI | % | 95%CI |
| Household income per capita (per quintile) | | | | | | | | | | | | | | | | |
| 1st quintile | 45.9 | (42.0-49.7) | 34.4 | (30.5-38.4) | 71.9 | (68.6-75.2) | 36.8 | (32.6-40.9) | 39.7 | (37.6-41.7) | 30.4 | (28.6-32.2) | 69.0 | (67.2-70.7) | 49.8 | (47.8-51.7) |
| 2nd quintile | 54.4 | (51.3-57.6) | 45.6 | (42.7-48.5) | 71.1 | (68.3-73.9) | 39.4 | (36.5-42.3) | 50.3 | (48.2-52.4) | 41.8 | (39.8-43.7) | 70.5 | (68.6-72.4) | 48.2 | (46.1-50.4) |
| 3rd quintile | 63.9 | (61.0-66.8) | 55.1 | (52.1-58.1) | 64.9 | (62.1-67.8) | 38.8 | (35.6-41.9) | 57.9 | (55.6-60.2) | 46.9 | (44.7-49.1) | 68.8 | (66.7-70.8) | 46.6 | (44.4-48.8) |
| 4th quintile | 70.0 | (67.6-72.3) | 60.1 | (57.5-62.7) | 58.1 | (55.6-60.7) | 41.5 | (39.1-43.9) | 63.1 | (60.7-65.5) | 54.6 | (52.0-57.1) | 63.8 | (61.6-66.1) | 46.8 | (44.3-49.3) |
| 5th quintile | 75.7 | (73.6-77.8) | 69.3 | (67.3-71.4) | 42.6 | (40.3-45.0) | 53.9 | (51.8-56.1) | 71.8 | (69.2-74.4) | 64.3 | (61.2-67.3) | 54.5 | (51.4-57.5) | 56.5 | (53.4-59.6) |
| Region of the country | | | | | | | | | | | | | | | | |
| North | 51.1 | (47.3-54.9) | 47.1 | (43.2-50.9) | 50.5 | (46.3-54.8) | 69.7 | (65.9-73.5) | 43.7 | (41.5-45.8) | 38.3 | (36.2-40.4) | 44.1 | (42.2-46.0) | 75.5 | (73.6-77.3) |
| Northeast | 50.2 | (47.9-52.5) | 56.1 | (53.7-58.4) | 65.1 | (62.7-67.5) | 57.1 | (54.7-59.5) | 43.9 | (42.5-45.4) | 46.6 | (45.1-48.0) | 67.2 | (65.9-68.5) | 57.3 | (55.7-58.9) |
| Southeast | 69.6 | (67.5-71.8) | 58.0 | (55.6-60.4) | 60.8 | (58.5-63.1) | 43.4 | (41.3-45.4) | 64.3 | (62.1-66.5) | 46.0 | (43.9-48.2) | 72.5 | (70.5-74.4) | 38.5 | (36.6-40.4) |
| South | 69.8 | (67.9-71.7) | 60.6 | (58.5-62.6) | 45.0 | (42.7-47.2) | 35.1 | (33.1-37.1) | 62.0 | (58.1-65.9) | 47.1 | (43.6-50.6) | 62.4 | (58.8-66.1) | 28.1 | (24.6-31.5) |
| Midwest | 71.0 | (68.1-73.9) | 53.8 | (50.3-57.2) | 66.3 | (63.3-69.4) | 41.8 | (38.4-45.2) | 63.5 | (61.0-66.0) | 45.7 | (42.9-48.5) | 71.7 | (69.6-73.8) | 41.4 | (38.4-44.3) |
| Localization of residence in the state | | | | | | | | | | | | | | | | |
| Capital and Metropolitan Region | 65.8 | (64.2-67.4) | 60.8 | (59.2-62.5) | 54.2 | (52.5-55.9) | 51.0 | (49.4-52.7) | 54.8 | (53.4-56.1) | 49.0 | (47.6-50.4) | 63.2 | (62.0-64.5) | 53.0 | (51.6-54.4) |
| Countryside | 66.6 | (64.7-68.4) | 55.5 | (53.4-57.6) | 60.1 | (58.1-62.0) | 39.4 | (37.6-41.2) | 54.2 | (52.7-55.8) | 42.7 | (41.2-44.2) | 69.2 | (67.9-70.6) | 45.7 | (44.2-47.2) |

Notes: *Black refers to the combined categories of black and brown color/race; 95%CI: 95% confidence interval.

Source: Brazil, NHS 2019.

with increasing age, there is a greater prevalence of NCDs and a greater demand for health services; thus, these women would be more likely to receive guidance on health care and nutrition, which would reflect on more healthy eating habits.

In all categories, fish was the food least consumed by the women in the study. Data from the National Food Survey (*Inquérito Nacional de Alimentação – INA*), between the years 2008-2009 and 2017-2018, revealed that there was a worsening in the quality of Brazilian food, showing a decrease in the consumption of beans and fish, giving space for a greater consumption of ultra-processed foods²⁴.

Explanations for the reduction in fruit and vegetable consumption among black women can be attributed to the fact that the consumption of these foods is directly influenced by availability, price and purchasing power, so that, in general, individuals from a higher income bracket spend more with food and buy more fruits and vegetables²⁵.

The results of this study indicate that black women show a weaker pattern of healthy food consumption markers when compared to white women, only surpassing white women in the consumption of beans. Considered one of the most traditional foods on the Brazilian menu, consumed mainly in the diet of individuals due

Table 2. Prevalence ratios (PR) and 95% confidence intervals (95%CI) using Poisson regression to analyze the association of color/race with indicators of healthy food consumption markers in adult women, interviewed in the 2019 NHS (n = 45,148), Brazil.

| Regression analyses | Healthy Food Consumption | | | | | | | |
|-----------------------|--------------------------|-----------|--------|-----------|-------|-----------|------|-----------|
| | Vegetables and Legumes | | Fruits | | Beans | | Fish | |
| | PR | 95%CI | PR | 95%CI | PR | 95%CI | PR | 95%CI |
| Crude | | | | | | | | |
| White | 1.00 | ---- | 1.00 | ---- | 1.00 | ---- | 1.00 | ---- |
| Black* | 0.82 | 0.80-0.85 | 0.79 | 0.76-0.81 | 1.16 | 1.13-1.19 | 1.11 | 1.07-1.15 |
| Adjusted ¹ | | | | | | | | |
| White | 1.00 | ---- | 1.00 | ---- | 1.00 | ---- | 1.00 | ---- |
| Black* | 0.98 | 0.95-1.01 | 0.91 | 0.88-0.95 | 1.07 | 1.04-1.10 | 1.01 | 0.97-1.04 |

¹Adjusted by age group, number of residents, education, per capita income quintile, region of the country, and location of the city of residence; *Black refers to the combined categories of black and brown color/race; 95%CI: 95% confidence interval.

Source: Brazil, NHS 2019.

to a low socioeconomic status during the Brazilian colonial period and because of its low price²¹. International studies attribute racial differences in dietary patterns to socioeconomic inequalities. Research shows that there is a higher cost of healthy foods (fruits and vegetables) and, therefore, a greater chance of their consumption by individuals with a better social position, generally observed among the white race, while other groups tend to consume foods linked to cultural identity²⁶.

Food consumption in Brazil is quite diverse, depending on the region, culture, and customs¹⁸. The present study confirmed the different food consumption profiles that characterize the five macroregions of the country. The North macroregion stood out for the highest prevalence of regular fish consumption, while the Midwest stood out for the consumption of fruits, vegetables, and legumes, and the Southeast for high bean consumption. Such regional differences in the distribution of dietary markers are corroborated by a previous analysis based on 2013 NHS data, where the prevalence of these dietary markers was confirmed in these Brazilian regions²⁷.

The II VIGISAN identified that, at the beginning of 2022, in the context of the COVID-19 pandemic, the proportion of food insecurity was higher in households whose main breadwinners identified themselves as black or mixed race. The results also showed a 70% increase in hunger among the black population in less than two years²⁸. Despite the different population and social context, in the United States, one study identified that 30% of the native black popula-

tion were food insecure, while this situation was found in only 10% of the native white population²⁹.

Although the results are of great importance for the development of actions to promote and prevent women's health, this study does have some limitations. This is a cross-sectional study, and the food consumption data analyzed herein were from selected residents of the household and not from all other residents. The answers may also be influenced by the cognitive capacity related to the memory of these interviewees. Another limitation was in relation to the categorization of this food consumption, in which it was not possible to evaluate the number of portions consumed and their frequency. Despite these limitations, NHS data are representative of the Brazilian adult female population and enable the identification of healthy eating behavior patterns and their racial inequalities in Brazil, especially for foods that are most frequently consumed by the country's population.

Therefore, our findings verified racial inequalities in healthy food consumption markers among Brazilian women, showing important differences according to socioeconomic, demographic, and state characteristics. Color/race also defined a dietary pattern for black women, which places them in vulnerable conditions when it comes to fruit consumption but in favorable conditions when it comes to beans.

When considering the precarious living and health conditions that characterize this marginalized population, it is recommended that intersectoral actions be designed and implemented in

order to promote healthy lifestyles that contribute to a decrease in body weight and improvements in nutrition among black women, thus diminishing inequalities throughout Brazil.

Race and gender, as social constructs, determine that black women are among the most vulnerable. The present study illustrates the need to understand socioeconomic inequalities and their consequences, such as possible impacts on

healthy diets among the Brazilian female population.

Furthermore, the results indicate that the food consumption of Brazilian women presents discrepancies in relation to healthy eating guidelines, which highlights a need for educational and health promotion actions focused on gender and race.

Collaborations

JF Figueiredo Neta: was responsible for creating the introduction and discussing the results. SCG: Collaborated in the introduction and discussion of the results. BLCA Oliveira: was responsible for the statistical analysis of the article's data. TLS Henrique: was responsible for formatting and sending the article, in addition to contributing to the description of the methods. RWJF Freitas: collaborated with the findings in discussing the results and describing the methods covered. NG Guedes: responsible for finalizing the discussion, along with the limitations of the study. AKB Pinheiro: was responsible for presenting the results and creating the tables and figures, in addition to the critical analysis of the article. MMC Damasceno: was responsible for the careful analysis of all the points covered, so that they were interconnected and in an understandable way for readers.

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