



Pregnant women's food consumption and associated socioeconomic factors in Brazil's primary health care

Consumo alimentar de gestantes e fatores socioeconômicos associados na atenção primária à saúde do Brasil

Consumo de alimentos de embarazadas y los factores socioeconómicos asociados en la atención primaria de salud de Brasil

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ABSTRACT

Objective: To assess food consumption by pregnant women receiving primary care and check for potential associations with socioeconomic variables. **Methods:** This cross-sectional study was conducted between April and November 2014 with a non-probability convenience sample of 201 pregnant women receiving primary care in Fortaleza, Ceará, Brazil. Food consumption data were collected using a Quantitative Food Frequency Questionnaire and socioeconomic data were collected using a specific instrument. Foods were quantified in portions and separated into the food groups described in the Dietary Guidelines for the Brazilian Population. STATA version 10.0 was used for statistical analysis. The normality of the quantitative variables was assessed by the Shapiro-Wilk test and the associations between food consumption and socioeconomic variables were assessed by the Mann-Whitney test with a 5% significance level. **Results:** There was a high consumption of calories (median of 3,991.6kcal) and all food groups, except legumes and vegetables. Lower levels of education were associated with higher consumption of cereals, tubers, roots and derivatives ($p=0.004$) and beans ($p=0.041$) and lower consumption of milk and dairy products ($p=0.032$). Women who lived with their partners exhibited higher consumption of sugars and sweets ($p=0.048$). **Conclusion:** The pregnant women's food consumption significantly exceeded the recommended number of calories and portions of the food groups – except for the legumes and vegetables group. Socioeconomic variables were associated with the consumption of certain food groups.

Descriptors: Pregnant Women; Food Consumption; Food Guide; Socioeconomic Factors; Diet.

RESUMO

Objetivo: Avaliar o consumo alimentar de gestantes atendidas na atenção primária à saúde e verificar possíveis associações com variáveis socioeconômicas. **Métodos:** Estudo transversal, realizado entre abril e novembro de 2014, com amostra não probabilística por conveniência de 201 gestantes atendidas na atenção primária de Fortaleza, Ceará, Brasil. Coletou-se o consumo alimentar por meio de um Questionário Quantitativo de Frequência Alimentar e as variáveis socioeconômicas, por



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meio de um instrumento próprio para tal. Os alimentos foram quantificados em porções e separados nos grupos de alimentos do Guia Alimentar para a População Brasileira. Utilizou-se o programa STATA, versão 10.0, para a análise estatística. Avaliou-se a normalidade das variáveis quantitativas pelo teste de Shapiro Wilk e a associação entre o consumo alimentar e as variáveis socioeconômicas, pelo teste de Mann Whitney, com nível de significância de 5%. **Resultados:** Houve consumo elevado de calorias (mediana de 3.991,6kcal) e de todos os grupos alimentares, com exceção do grupo de legumes e verduras. Menor escolaridade associou-se com maior consumo de cereais, tubérculos, raízes e derivados ($p=0,004$), de feijões ($p=0,041$) e menor consumo de leites e derivados ($p=0,032$). Mulheres que viviam com o companheiro apresentaram maior consumo de açúcares e doces ($p=0,048$). **Conclusão:** O consumo alimentar das gestantes ultrapassou significativamente as recomendações de calorias e porções dos grupos alimentares, com exceção de legumes e verduras. Variáveis socioeconômicas se associaram ao consumo de determinados grupos de alimentos.

Descritores: Gestantes; Consumo de alimentos; Guias alimentares; Fatores socioeconômicos; Dieta.

RESUMEN

Objetivo: Evaluar el consumo de alimentos de embarazadas asistidas en la atención primaria de salud y verificar las posibles asociaciones con las variables socioeconómicas. **Métodos:** Estudio transversal realizado entre abril y noviembre de 2014 con la muestra no probabilística de conveniencia con 201 embarazadas asistidas en la atención primaria de Fortaleza, Ceará, Brasil. Se recogió datos del consumo de alimentos a través de un Cuestionario Cuantitativo de la Frecuencia de Alimentos y las variables socioeconómicas a través de un instrumento propio para eso. Los alimentos han sido cuantificados en porciones y separados en grupos de alimentos de la guía de alimentos para la población brasileña. Se utilizó el programa STATA versión 10.0 para el análisis estadístico. Se evaluó la normalidad de las variables cuantitativas con la prueba de Shapiro Wilk y la asociación entre el consumo de alimentos y las variables socioeconómicas con la prueba de Mann Whitney con el nivel de significación del 5%. **Resultados:** Hubo elevado consumo de calorias (mediana de 3.991,6kcal) y de todos los grupos de alimentos a excepción del grupo de las legumbres y las verduras. La baja escolaridad se asoció con el mayor consumo de cereales, tubérculos, raíces y sus derivados ($p=0,004$), frijoles ($p=0,041$) y bajo consumo de leches y sus derivados ($p=0,032$). Las mujeres que vivían con sus compañeros consumían más azúcares y dulces ($p=0,048$). **Conclusión:** El consumo de alimentos de embarazadas ha superado significativamente las recomendaciones de las calorias y las porciones de los grupos de alimentos a excepción de las legumbres y las verduras. Las variables socioeconómicas se asociaron con el consumo de determinados grupos de alimentos.

Descriptor: Mujeres Embarazadas; Consumo de alimentos; Guías alimentarias; Factores Socioeconómicos; Dieta.

INTRODUCTION

Timely initiation of prenatal care is essential when taking into account the monitoring of pregnant women's health through early diagnosis and management of potential complications. Several factors are important in such monitoring, including nutritional history, which helps identify cases of malnutrition, overweight, obesity, nutritional deficiencies, among other issues⁽¹⁾. Prenatal care is an important indicator of primary care quality⁽²⁾.

Guidance on healthy eating during pregnancy established by official bodies assists health professionals during consultations and educational activities. Thus, the primary care booklet number 32⁽²⁾ published by the Ministry of Health to deliver information on low-risk prenatal care provides pregnant women with guidance on the food groups of the 2006 Dietary Guidelines for the Brazilian Population⁽³⁾. In addition to general guidelines on the number of daily meals, fluid intake, consumption of natural and healthy foods, there is a determination of the number of daily servings for the following food groups: rice, bread, pasta, potatoes and cassava (six servings); vegetables (three servings); fruits (three servings); beans (one serving); milk, cheese and yogurt (three servings); meat, fish and eggs (one serving); oils and fats (one serving); sugars and sweets (one serving)^(2,3).

The guidelines were updated in 2014 with the aim of facilitating access to knowledge about adequate and healthy eating and hence allow people to expand their autonomy to make better choices. However, guidelines based on food groups were not included⁽⁴⁾.

Action plans and development of interventions to control the food quality can be enhanced by knowledge of the dietary intake of pregnant women and thus help improve weight adequacy in this phase of life. Nutrition is essential for a healthy pregnancy as the maternal nutritional status affects the growth and development of the newborn⁽²⁾.

Food intake during pregnancy is complex, especially among low-income women, as several barriers may be present, such as failures in education, unemployment, unhealthy behaviors, lack of social support, among others⁽⁵⁾.

Given the importance of nutrition during pregnancy, the present study aimed to assess food consumption by pregnant women receiving primary care and its potential associations with socioeconomic variables.

METHODS

This quantitative cross-sectional study was conducted at nine randomly-selected family health care centers distributed across six administrative regions of Fortaleza, Ceará, Brazil.

The data were collected between April and November 2014 using non-probability convenience sampling with 201 pregnant women aged 19 years or older who visited the health care centers for prenatal consultation. No exclusion criteria were used for sampling.

In this study, a socioeconomic questionnaire was used to assess the following variables: age, education, marital status, household income and number of children. Age was divided into two groups: under 35 years old and 35 years old and older, the latter indicating risky pregnancy⁽²⁾. Levels of education were divided into 9 years of study or less, which is equivalent to primary education, and more than 9 years of study, representing secondary or higher education. Marital status was divided into living with a partner and living without a partner no matter the legal status of the relationship. Income levels were grouped into two minimum wages or less and more than two minimum wages considering the minimum wage in the year 2014 (R\$ 724.00). Number of children was divided into three or less and more than three.

A quantitative Food Frequency Questionnaire (FFQ) was used to assess food intake. The questionnaire was developed for adult pregnant women of low socioeconomic status and experiencing low-risk pregnancy⁽⁶⁾, an audience similar to that included in the present study. The instrument allows to assess food consumption during whole pregnancy and it has an open-ended question to check whether there are other foods frequently consumed by pregnant women that are not present in the FFQ, thereby allowing the inclusion of new foods.

The quantitative FFQ used was composed of 85 items, including consumption frequency (daily, weekly, monthly, or during pregnancy), number of times the participant consumed each food, median serving in cooking measurements in g/ml and the size of the serving consumed. The frequency of consumption reported as during pregnancy refers to more sporadic consumption than monthly, but the food is still consumed during pregnancy⁽⁶⁾.

Food consumption was assessed considering the adequacy of the number of servings of each food group according to the Dietary Guidelines for the Brazilian Population: Promoting Healthy Eating. The standard serving sizes corresponding to each food item contained in the FFQ were calculated using the average grams described in the food table titled "Servings of Food (in Grams) and The Usual Measurements of Corresponding Consumption" contained in the Dietary Guidelines for the Brazilian Population⁽³⁾.

When a food item in the FFQ was not present in the Dietary Guidelines for the Brazilian Population, an equivalent food table - NUTRIVISA⁽⁷⁾ was used. With regard to meals, the standard recipes contained in the appropriate table⁽⁸⁾ were used. The significant ingredients in each serving (at least 5 grams/ml per 100g of the meal) were assessed, with the exception of oils, fats and oilseeds, which were assessed even if present in smaller amounts. The processed foods or the ingredients of meals that were not present in any of the mentioned materials had their serving sizes calculated based on calories listed on the food labels and their equivalent value in the corresponding food groups of the Dietary Guidelines for the Brazilian Population.

The Dietary Guidelines for the Brazilian Population establish the servings based on a standard diet of 2000kcal distributed across the groups. However, the American Dietetic Association (ADA) states that most pregnant women need between 2200 and 2900kcal per day during pregnancy to meet the energy needs of this period⁽⁹⁾. This study was based on the recommendation of 2500Kcal per day, which is approximately the mean of the two values proposed by the ADA. Additionally, the recommended servings listed in the Dietary Guidelines for the Brazilian Population were adapted according to this value⁽³⁾.

The calculation of the consumed servings of each food group as well as the statistical analysis were performed using STATA version 10.0⁽¹⁰⁾. The Shapiro-Wilk test was used to check for normality between the quantitative variables. Continuous variables were presented as median (25th – 75th percentile) or mean values and categorical variables were described as simple frequencies and percentages. The Mann-Whitney U test was used to check for associations between consumption of food groups and socioeconomic variables. The significance threshold was set at 5%.

The study complied with Resolution 12/466 and was approved by the Research Ethics Committee of the Ceará State University (*Universidade Estadual do Ceará – UECE*) with Approval No. 388.016. All the participants in the study signed an Informed Consent Form.

RESULTS

The mean age of pregnant women was 25.8±5.4 years and only 7% (n=14) were older than 35 years. Slightly over half (51.7%; n=104) of the participants reported having more than 9 years of study and most lived with a partner

(76.6%; n=154), had an income of two minimum wages or less (93.2%; n=178) and had three children or less (70.7%; n=142) (Table I).

Table I - Socioeconomic characteristics of pregnant women assisted in primary care. Fortaleza, Ceará, Brazil, 2014.

Characteristics	n	%
Age (years)		Total* (n=201)
≤ 35	187	93.0
> 35	14	7.0
Education (years)		Total* (n=201)
≤ 9	97	48.3
> 9	104	51.7
Marital status		Total* (n=201)
With partner	154	76.6
Without partner	47	23.4
Household income (MW)		Total* (n=191)
≤ 2	178	93.2
> 2	13	6.8
Number of Children		Total* (n=201)
≤ 3	142	70.7
> 3	59	29.3

* Variation of n due to the absence of information about some pregnant women. MW = Minimum Wage

The median energy consumed by pregnant women was 3,991.6kcal and the 25th and 75th percentiles corresponded to 2,934.8kcal and 5,265.1kcal daily, respectively. The number of servings of food groups reported was high according to the Brazilian recommendation for all groups, except for vegetables, which was below the recommendation (Table II).

Table II - Pregnant women's food consumption according to the food groups in the Dietary Guidelines for the Brazilian Population. Fortaleza, Ceará, Brazil, 2014. (n=201)

Groups of Food	Recommendations of daily servings per group (TCI 2500 kcal*)	Daily servings found Median(%25 - %75**)
Cereals, tubers, roots e derivatives	7.5	8.9 (5.5 – 12.8)
Beans	1.25	2.4 (1.2 – 2.6)
Fruit and natural fruit juices	3.75	5.5 (3.2 – 9.9)
Vegetables	3.75	1.2 (0.6 – 2.8)
Milk and dairy products	3.75	4.6 (2.6 – 8.0)
Meat and eggs	1.25	3.0 (2.1 – 4.8)
Oils, fats and oilseeds	1.25	2.4 (1.6 – 3.5)
Sugars and sweets	1.25	3.6 (1.8 - 5.4)

*Calorie intake adapted for pregnancy requirements according to ADA; ** The 25th and 75th percentiles

The pregnant women with lower levels of education consumed more cereals, tubers, roots and derivatives (p=0.004) and beans (p=0.041) and consumed less milk and dairy products (p=0.032). Women who lived with a partner consumed significantly more sugar and sweets (p=0.048).

Consumption of food groups (meat and eggs, vegetables, fruits and natural fruit juices, oils, fats and oilseeds) was not significantly associated with any of the socioeconomic variables (age, education, marital status, household income and number of children) (Tables III and IV).

Table III - Association between socioeconomic variables and food consumption. Fortaleza, Ceará, Brazil, 2014. (n=201)

Socioeconomic variables	Energy	Cereals, tuber, roots and derivatives	Meat and eggs	Oils, fats and oilseeds	Sugas and sweets
Age (years)	p=0.703	p=0.181	p=0.373	p=0.481	p=0.750
≤ 35 (n=187)	3991.65 (2865-5289.76)	8.94 (5.46-12.90)	2.97 (2.07-4.86)	2.33 (1.54-3.45)	3.63 (1.81-5.38)
> 35 (n=14)	3859.53 (3020.04-4953.33)	7.07 (5.76-10.45)	4.14 (2.32-4.79)	2.79 (1.90-3.57)	3.98 (1.36-6.68)
Education (years)	p=0.394	p=0.004	p=0.634	p=0.113	p=0.238
≤ 9 (n=97)	4126.49 (3074.70-5721.53)	10.06 (7.07-14.10)	3.14 (2.29-4.97)	2.55 (1.71-3.46)	3.65 (1.97-5.85)
> 9 (n=104)	3720.66 (2859.32-5157.55)	7.84 (4.93-11.26)	3.00 (2.05-4.51)	2.10 (1.47-3.28)	3.62 (1.51-4.73)
Marital status	p=0.808	p=0.066	p=0.510	p=0.114	p=0.048
With partner (n=154)	4060.82 (2934.86-5196.39)	8.64 (5.30-12.28)	2.92 (2.07-4.79)	2.27 (1.54-3.32)	3.74 (1.89-5.77)
Without partner (n=47)	3800.75 (2798.36-5915.39)	9.97 (7.07-13.65)	3.34 (2.16- 5.52)	2.83 (1.69-4.53)	2.69 (1.24-4.76)
Household income	p=0.625	p=0.129	p=0.926	p=0.329	p=0.499
≤ 2 (n=178)	4009.05 (2985.77-5268.27)	9.04 (5.52-12.82)	3.00 (2.16-4.81)	2.42 (1.54-3.46)	3.64 (1.85-5.45)
> 2 (n=13)	3988.16 (2765.31-5517.66)	7.96 (4.28-13.15)	3.29 (1.99-5.79)	2.01 (1.53-2.97)	2.46 (1.41-4.53)
Number of children	p=0.743	p=0.208	p=0.747	p=0.199	p=0.485
≤ 3 (n=142)	4007.31 (2885.44-5183.70)	8.72 (5.17-12.63)	3.03 (2.07-4.79)	2.29 (1.50-3.37)	3.65 (1.86-4.99)
> 3 (n=59)	3991.65 (2974.79-5915.39)	9.62 (5.80-13.60)	3.02 (2.07-5.07)	2.83 (1.73-3.62)	3.58 (1.78-6.59)

The Mann-Whitney U test, $p \leq 0,05$

Table IV - Association between socioeconomic variables and food intake. Fortaleza, Ceará, Brazil. 2014. (n=201)

Socioeconomic variables	Vegetables	Fruits and natural fruits juice	Beans	Milk and derivatives
Age (years)	p=0.205	p=0.732	p=0.183	p=0.429
≤ 35 (n=187)	1.19 (0.60-2.68)	5.48 (3.13-9.95)	2.36 (1.18-2.59)	4.69 (2.62-8.39)
> 35 (n=14)	1.55 (0.93-3.54)	5.78 (4.12-10.49)	2.40 (1.18-4.72)	4.59 (1.47-6.45)
Education (years)	p=0.074	p=0.097	p=0.041	p=0.032
≤ 9 (n=97)	1.09 (0.48-2.46)	5.10 (2.41-9.65)	2.36 (1.18-4.72)	4.30 (2.01-6.38)
> 9 (n=104)	1.39 (0.69-3.31)	6.27 (3.51-10.28)	1.81 (1.18-2.48)	5.51 (2.91-8.90)
Marital status	p=0.076	p=0.984	p=0.776	p=0.173
With partner (n=154)	1.23 (0.71-2.82)	5.65 (3.02-10.33)	2.36 (1.18-2.56)	4.77 (2.62-8.83)
Without partner (n=47)	0.87 (0.40-2.19)	5.37 (3.75-8.59)	2.36 (0.84-4.72)	4.30 (2.31-6.22)
Family income	p=0.536	p=0.640	p=0.115	p=0.187
≤ 2 (n=178)	1.2 (0.61-2.72)	5.49 (3.13-10.15)	2.36 (1.18-3.23)	4.61 (2.58-7.54)
> 2 (n=13)	1.06 (0.80-3.54)	4.22 (3.01-6.43)	1.31 (1.18-2.36)	5.13 (4.10-11.01)
Number of children	p=0.779	p=0.334	p=0.677	p=0.628
≤ 3 (n=142)	1.19 (0.61-2.68)	6.12 (3.14-10.07)	2.36 (1.18-2.59)	4.63 (2.66-7.43)
> 3 (n=59)	1.20 (0.66-2.93)	4.84 (3.24-9.95)	2.36 (1.18-3.51)	4.71 (1.92-8.99)

The Mann-Whitney U test, $p \leq 0,05$

DISCUSSION

The median calorie consumption of pregnant women was high – even when considering the quartile with the lowest caloric value (2,934.8kcal) – compared to the recommendation of 2,500kcal adopted in the present study⁽⁹⁾. The energy consumed during pregnancy and the quality of the food chosen are crucial to characterize healthy eating in pregnancy⁽¹¹⁾. The calorie excess was the result of the high consumption of nearly all food groups, except the vegetables group.

Research has shown that pregnant women need to remain well nourished for their own health as the fetus depends on the mother's nutritional status to obtain specific energy and nutrients that contribute to the structure, biochemistry, physiology and function of the brain. However, further studies are needed to determine how much maternal malnutrition, whether due to excess or deficiency, can influence fetal development and birth outcomes⁽¹²⁾.

The preliminary results of the 2017-2018 Household Budget Survey (*Pesquisa de Orçamentos Familiares – POF*)⁽¹³⁾ show that of the total percentage spent on food (17.5%), the Northeast region presented the highest percentage of consumption of cereals, legumes and oilseeds (6.7%), which is almost double the one found in the South Region (3.7%), which was the lowest in the country. The previous POF (2008-2009)⁽¹⁴⁾ had shown that rice and beans exhibited some of the highest mean values of daily consumption per capita in Brazil. Similar results were found in the present study, with a mean number of servings of 8.5 for cereals, tubers, roots and derivatives – the recommended for a standard 2,500kcal diet is 7.5.

Pregnant women with lower levels of education consumed more cereals, tubers, roots and derivatives and beans. Rice is one of the most representative foods of the cereal group in Brazilian food and is commonly consumed with beans, which may be a possible explanation for the high consumption of both groups. The most socially vulnerable portion of the Brazilian population showed a higher consumption of rice, beans, cassava flour, among other food items, according to POF 2008-2009⁽¹⁴⁾.

A study conducted in the primary health care system of the Recôncavo Baiano⁽¹⁵⁾ assessed the daily consumption among 70 pregnant women between 20 and 45 years old and found that the most frequently consumed food groups were cereals and cereal products (bread, cookies, cakes and noodles), especially rice, consumed by 70% of the pregnant women. The high daily consumption of cereals and derivatives found in this study agrees with the national guidelines which state that that this group should account for the highest calorie percentage in the daily diet⁽³⁾. However, because these are pregnant women, attention should be paid to monitoring the monthly weight gain so that it does not exceed the average weekly recommendations of 400 grams for pregnant women with adequate weight, 500 grams for those with malnutrition, 300 grams for overweight women and 200 grams for obese women⁽²⁾.

The Vigitel National Telephone Survey (2018)⁽¹⁶⁾ found a regular consumption of beans by 59.5% of the adult population of 27 cities, with men (66.4%) consuming more than women (53.6%). Once again it is observed that beans are still part of the Brazilian eating habits, which was also found in the present study – even though its consumption was above the recommended. In addition, results similar to those of the present study were obtained with data from Vigitel (2018)⁽¹⁶⁾, such as the decrease in bean consumption as the level of education increased. As previously mentioned, the daily consumption of beans, especially with rice, is a typical meal in the Brazilian diet and is important for providing an adequate combination of proteins in pregnant women's diet. However, pregnant women should be advised to avoid preparations with excess fatty and salty meat, as well as sausages, as they increase the amount of fat and salt in the diet⁽²⁾.

It should be noted that in a study carried out in Spain with women whose babies were small for gestational age (SGA), the high consumption of legumes, especially beans, seemed to reduce the risk of SGA newborns, although the researchers stated that such findings needed further investigation⁽¹⁷⁾.

The high consumption of fruits found contradicts some findings of studies carried out with pregnant women. For example, a study conducted with 785 adult pregnant women in the city of Ribeirão Preto, São Paulo, showed that only 18.3% of pregnant women reached the maximum score for fresh fruit consumption⁽¹⁸⁾. In addition to that, another study conducted in Brazil pointed out a low consumption of fruit by pregnant women in primary care⁽¹⁹⁾. Results of dietary intake among pregnant women attending primary care in Jazan, Saudi Arabia, showed that only 26.7% of them ate fruits daily⁽²⁰⁾.

Contrary to the results of studies that show low consumption of fruit by pregnant women, preliminary results from the last POF⁽¹³⁾ have shown an increase in fruit consumption among the Brazilian population in general due to the increase in expenditure on this food group (4.2 % in 2002-2003; 4.6% in 2008-2009 and 5.2% in 2017-2018). This trend may help understand the high consumption of fruit by pregnant women in the present study. It can also be a hope that such healthy foods are contributing more significantly to the daily diet of Brazilian pregnant women.

The Ministry of Health recommends daily consumption of three servings of fruits and three servings of vegetables for pregnant women⁽²⁾. In the present study, fruit consumption alone would exceed the five servings recommended for adults. However, considering the adaptation of servings according to the daily caloric needs of pregnant women, the sum of the medians of fruits and vegetables would not yet reach the amount necessary for pregnancy according to the recommendations described in the Dietary Guidelines for the Brazilian population⁽³⁾.

According to Vigitel data (2018)⁽¹⁶⁾, the frequency of adults who consume five or more daily servings of fruits and vegetables ranged from 23.0% in Belém to 44.7% in Florianópolis. In the city where the present study was conducted (Fortaleza), the frequency found for women was 28.5%, which can be considered low when compared to some other capitals analyzed.

In contrast to the fruits, the vegetables were consumed much less than recommended in the present study. It is known that not only the vegetables, but also the fruits are excellent sources of vitamins, minerals and fibers, which are essential for a healthy fetus development and maternal health protection⁽⁴⁾. Although fruits may partly compensate for the deficiencies of vegetables in the daily diet, they have more calories than vegetables⁽⁴⁾, which must be carefully observed, especially for pregnant women with high caloric intake. In addition to the important aspects already highlighted, some studies have shown the relationship between adequate fruit consumption and low risk of SGA newborns⁽¹⁷⁾ and the association between frequent consumption of vegetables and reduced likelihood of premature births⁽²¹⁾.

A study carried out with adults of both sexes in Teresina, Piauí, showed consumption below the recommended for the following groups: grains (58.75%), vegetables (96.25%), fruits (80%) milk and derivatives (86.25%)⁽²²⁾.

Given what is known about the contribution of fruits and vegetables to a healthy pregnancy, efforts must be made to assist pregnant women in primary care in the daily consumption of such foods, even with the difficulties imposed by the social vulnerability of part of the Brazilian population.

The high consumption of oils, fats and oilseeds observed in this study a mean of 2.4 (1.6 - 3.5) servings per day – raises concern since they represent the group with the highest calorie content per gram or milliliter, thereby increasing significantly the energy value of meals and favoring weight gain above the recommended. Despite that, it is important to note that in this group there are also fats considered healthy, which are mainly present in oilseeds. However, it was not possible to identify their consumption due to the recommendations described in the guidelines for the Brazilian population, which gather oilseeds, oils and fats in the same group⁽³⁾.

According to the results of the present study, lower levels of education were associated with lower consumption of milk and dairy products. Studies conducted with adult⁽²³⁾ and adolescent pregnant women⁽²⁴⁾ found high consumption of milk and dairy products among women with higher levels of education.

There was also a significant association between consumption of sugars and sweets and marital status. Consumption was higher among women who lived with their partners. A Canadian study conducted with 2,633 pregnant women⁽²⁵⁾ showed a different result. The researchers found that being single and of a low socioeconomic status were associated with excess gestational weight gain and consequently high consumption of all food groups, including sugars and sweets.

The consumption of sugars and sweets were way above the recommendation, contributing to almost 16% of the daily caloric value of the diet from empty calories. An observational study⁽²³⁾ analyzed the diet of 60 pregnant women and found that 60% of the study population added sugar to their preparations.

Excess sugar influences weight gain and increases the risk of obesity. A cohort study conducted in Denmark with 103,119 pregnant women⁽²⁶⁾ demonstrated that the consumption of added sugar was strongly related to gestational overweight (28 to 40g/week). Consumption of sweet foods and soft drinks accounts for a large part of the consumption of added sugar in Brazil⁽²⁷⁾. In the present study, soft drinks and artificial juices were grouped into the sugars and sweets group.

The assessment of the consumption of sweet foods estimated by Vigitel (2016)⁽²⁸⁾ showed that the highest weekly frequency of consumption of ice cream, chocolates, cakes, cookies or sweets among women occurred in Curitiba (27.4%), and the lowest was in Manaus (9.8%). In Fortaleza, the frequency was 18.6%.

The monitoring of pregnant women and the provision of guidance on adherence to a healthy diet rich in fruits and vegetables and without the presence of ultra-processed foods⁽⁴⁾ is strongly recommended as a way to avoid excessive weight gain and adverse situations for both the mother and the fetus^(17,21,29,30). In addition, there is evidence that a low-quality diet may be associated with low adherence to the guidelines on gestational weight gain⁽³⁰⁾.

Thus, knowing the women's food consumption during pregnancy in primary care is an important strategy to assist in nutritional education activities based on local needs. These activities should take into consideration the diversity of

knowledge and comply with the National Health Promotion Policy (*Política Nacional de Promoção da Saúde – PNPS*)⁽³¹⁾, which considers the promotion of adequate and healthy eating for the Brazilian population one of its priority themes.

The present study has some limitations. First, the use of a quantitative FFQ as a data collection instrument may have increased the possibility of response bias as the responses were self-reported. In addition, the fact that we pre-established the servings of each food group may have led to overestimation of the amount consumed.

CONCLUSION

The results of this study suggest pregnant women's food consumption significantly exceeded the recommendations for calories and servings of food groups, with the exception of vegetables.

Lower levels of education were associated with higher consumption of cereals and beans and lower consumption of milk and dairy products, while living with a partner was associated with higher consumption of sugars and sweets.

CONFLICTS OF INTEREST

There are no conflicts of interest.

CONTRIBUTIONS

Geisyanne Soares da Silva, **Daniela Vasconcelos de Azevedo** and **Natália Sales de Carvalho** contributed to the study conception and design; acquisition, analysis and interpretation of data; writing and revision of the manuscript; **Soraia Pinheiro Machado Arruda** contributed to the acquisition, analysis and interpretation of data; **Raquel Bezerra de Abreu**, **Beatriz Paiva Rocha** and **Isadora Ramos da Costa Rodrigues** contributed to the writing and revision of the manuscript.

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