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Responsibility for purchase or preparation of food at home among participants of the Programa Academia da Saúde

Responsabilidade pela compra e/ou preparo dos alimentos no domicílio entre participantes do Programa Academia da Saúde

Abstract

Introduction: Culinary skills (CS) are emancipatory practices that promote the adoption of healthy eating habits, encompassing stages from food purchasing and preparation to sanitation of spaces. ***Objective***: To investigate the association between responsibility for food purchasing and/or preparation and sociodemographic characteristics, dietary intake, and perceptions regarding fruit and vegetable (F&V) purchasing and preparation among participants of the Health Academy Program (Programa Academia da Saúde - PAS) in Belo Horizonte, Brazil. ***Methods***: A cross-sectional study was conducted with participants aged ≥20 years from a representative sample of the municipal PAS. Sociodemographic data, food consumption, perceptions about purchasing and/or preparing F&V, and responsibility for food purchasing/preparation were investigated. Chi Square, Mann Whitney, and Multiple Logistic Regression tests were performed ($p<0.05$). ***Results***: Of the 3,300 participants, 88.0% were female and 56.4% were adults. Most participants (90.5%) reported being responsible for food purchasing and/or preparation, which was associated with being female (OR=5.42), having a partner (OR=1.58), lower soft drink consumption (OR=1.48), perceiving F&V preparation as easy and quick (OR=1.37), having time to purchase these foods (OR=1.43), and being familiar with the concept of seasonality (OR=1.46). ***Conclusion***: Being responsible for food purchasing and/or preparation was associated with sociodemographic characteristics, healthier eating patterns, time availability, CS, and seasonal food knowledge. These findings underscore the importance of addressing modifiable factors, such as equitable distribution of household responsibilities and enhancement of CS among men, to reduce burden, increase self-efficacy, and promote autonomy in achieving an adequate and healthy diet.

Keywords: Household chores. Cooking. Food consumption. Sociodemographic factors.

Resumo

Introdução: As habilidades culinárias (HC) são práticas emancipatórias que favorecem a adoção de hábitos alimentares saudáveis, envolvendo etapas que vão desde a compra e o preparo dos alimentos, até a higienização dos espaços. ***Objetivo***: Analisar a associação entre a responsabilidade pela compra e/ou preparo dos alimentos e o perfil sociodemográfico, consumo alimentar e percepções sobre compra e preparo de frutas e hortaliças (FH) entre participantes do Programa Academia da Saúde (PAS) de Belo Horizonte-MG. ***Métodos***: Estudo transversal realizado com participantes ≥20 anos

de amostra representativa do PAS do município. Foram investigados dados sociodemográficos, consumo alimentar, percepções sobre compra e/ou preparo de FH, e responsabilidade pela compra/preparo dos alimentos. Realizaram-se os testes Qui Quadrado, Mann Whitney e Regressão Logística Múltipla ($p<0,05$). ***Resultados***: Dos 3.300 participantes, 88,0% eram mulheres e 56,4% adultos. A maioria (90,5%) relatou ser responsável pela compra e/ou preparo dos alimentos, condição associada a ser do sexo feminino (OR=5,42), ter companheiro/a (OR=1,58), consumir menos refrigerantes (OR=1,48), considerar fácil e rápido preparar FH (OR=1,37), ter tempo para comprar esses alimentos (OR=1,43) e conhecer o conceito de safra (OR=1,46). ***Conclusão***: Ser responsável pela compra e/ou preparo dos alimentos se associou a características sociodemográficas, consumo alimentar mais saudável, a ter tempo, HC e conhecimento sobre safra dos alimentos. Esses resultados denotam a necessidade de intervir sobre os fatores modificáveis, como o compartilhamento das tarefas domésticas entre todos os moradores da casa e o aprimoramento das HC entre os homens, visando promover menor sobrecarga, e maior autoeficácia e autonomia para se alcançar uma alimentação adequada e saudável.

Palavras-chave: Tarefas Domésticas. Culinária. Consumo alimentar. Fatores Sociodemográficos.

INTRODUCTION

An adequate and healthy diet is a fundamental human right encompassing individual, biological, social, cultural, environmental, and economic dimensions, as well as food accessibility. A healthy and balanced diet should be based on fresh and minimally processed foods, such as fruits and vegetables (F&V), as well as culinary preparations derived from these foods. In this context, the development and enhancement of cooking skills (CS) and the sharing of household tasks are highly relevant for maintaining healthy eating habits in the long term.[1,2]

Preparing one's own food contributes to food autonomy and promotes healthier and more mindful choices. This practice is encouraged by dietary guidelines in different countries such as Uruguay, Japan, and Canada, with Brazil being particularly noteworthy.[1,2] However, cooking is complex and dynamic and extend beyond food preparation. It encompasses various activities including planning, purchasing, cleaning and storing food, as well as cleaning preparation spaces.[3] Furthermore, it can be influenced by various cultural, temporal, historical, and sociodemographic aspects, particularly CS.[4,5]

The literature shows that individuals proficient in various CS, including food purchasing and/or preparation, tend to consume fewer ultra-processed foods (UPF).[6] Additionally, those who dedicate more time to their meals show higher consumption of F&V.[1,7,8] These findings are particularly significant considering that excessive consumption of UPF, coupled with insufficient intake of fresh and minimally processed foods, represents a major risk factor for non-communicable chronic diseases (NCDs), such as obesity, diabetes *mellitus*, and hypertension, which account for over 70% of deaths both in Brazil and worldwide.[2,9]

Despite the benefits of cooking, the intergenerational transmission of CS has become increasingly rare and remains restricted to women, perpetuating gender inequalities.[7,10,11] This scenario undermines food culture preservation, self-efficacy, and individual autonomy in food preparation,[2] contributing to the culinary transition—a phenomenon characterized by profound changes in CS patterns and types, with potential negative implications for people's relationship with food.[7,11]

Although the importance of cooking and CS as emancipatory practices for adopting healthy eating habits is recognized, these topics remain understudied in Brazil, particularly regarding food consumption and dietary practices. This study aimed to investigate whether being responsible for household food purchasing and/or preparation is associated with sociodemographic characteristics, dietary intake, and perceptions about F&V purchasing and preparation among participants of the Health Academy Program (Programa Academia da Saúde - PAS) in Belo Horizonte, Brazil.

METHODS

Type and place of study

Cross-sectional study based on baseline data from a randomized controlled community trial titled "Fruit and Vegetable Consumption in Health Promotion Services in Belo Horizonte, Minas Gerais: Associated Factors and Nutritional Interventions," conducted at the PAS in Belo Horizonte, MG, aimed at developing and evaluating nutritional interventions to promote F&V consumption.[12]

In Belo Horizonte, Minas Gerais, the Program was established in 2006 under the name of Academia da Cidade (City academy) and was one of the successful initiatives that led to its nationwide expansion in 2011.[13] PAS is a health promotion and care service within Primary Health Care (PHC), equipped with infrastructure, equipment, and qualified professionals to support actions focused on physical activities and body practices;

health care and healthy lifestyle promotion; healthy eating habits; integrative, complementary, artistic, and cultural practices; health education; community engagement; and planning and management.[14] As of 2019, 4,188 PAS units were operational across the country, with presence in all Brazilian macro-regions.[15]

Belo Horizonte, Minas Gerais, currently has 82 PAS units operating during morning, afternoon, and/or evening shifts, serving approximately 15,000 individuals. The program offers regular physical activities, including fitness training, dance, sports, and guided walking, as well as health education initiatives. The activities take place three times a week, lasting 60 minutes each, and are led by Physical Education professionals. Access to the service is available through direct enrollment at PAS units or by referral from local Primary Healthcare Units. When they join, participants are assessed by a physical education professional, who assigns them to the appropriate class for their particularities.[16]

Sampling

At the time the study sample was drawn, in 2012, the municipality of Belo Horizonte-MG had 50 PAS units. The selection criteria for the study units included: being located in areas of medium or high/very high health vulnerability (priorities for implementing the PAS in the municipality), operating during morning (predominant operating shift of the Program), and not having participated in food and nutrition research in the previous two years.[12] Forty-two units were eligible and randomly assigned to control and intervention groups, stratified according to the municipality's nine administrative regions, resulting in 18 participating units. This sample was representative of the PAS of territories with medium and high/very high vulnerability in the municipality, with a confidence level of 95% and an error of 1.4%.

In the sampled units, all individuals aged 20 years or older who regularly attended PAS activities in the month prior to the interview were invited to participate in the study. The exclusion criteria were: being pregnant and having some cognitive impairment that prevented questionnaire completion. A total of 3,763 frequent users of the services were identified, with 237 refusals (6.3%) and 112 exclusions (3.0%), yielding a final sample of 3,414 users.[12] For this study, individuals who did not answer to the question about being responsible for food purchasing and/or preparation were excluded, as this was central to the study's objectives, resulting in 3,300 participants (96.7%).

Data collection

Data were collected between February 2013 and June 2014 by a trained research team. Face-to-face interviews were conducted using questionnaires based on national surveys and previously field-tested. The following variables were investigated: sociodemographic characteristics (age, sex, monthly *per capita* income, education level, occupation, and marital status); consumption of fruits, vegetables, and UPF (cream-filled cookies, sweets, salty snacks, soft drinks, and powdered beverages); perceptions regarding the purchase and preparation of F&V; seasonal food knowledge; and responsibility for purchasing and/or preparing food in the household.[12]

Study variables

The outcome variable of this study - responsibility for food purchasing and/or preparation - was assessed through the question "*Are you responsible for purchasing or preparing food in your household?*" with

yes/no response options. When answering affirmatively, participants indicated their responsibility for either one or both tasks.

Sociodemographic variables included sex (male; female), age (adults: 20-59; elderly: ≥60 years), marital status (partnered; unpartnered), occupation (homemaker; retired/pensioner; other), monthly *per capita* income (in Brazilian reais), and education level (<8; 8-11; ≥12 years of schooling).

The assessment of F&V consumption included the frequency and number of daily portions of each group of these foods. Consumption frequency was assessed using the validated Brief Questionnaire for Fruit and Vegetable Intake Assessment (Brief-FV),[17] which included the following questions: "*How many days per week do you usually eat fruits?*" and "*How many days per week do you usually eat at least one type of leafy vegetables and non-leafy vegetables?",* followed by examples from each food group. The answers were categorized as regular consumption (≥5 days/week) or irregular consumption (≤4 days/week). To assess daily portions, participants were asked: *"On a typical day, how many servings of fruit do you consume?"*, *"On a typical day, how many tablespoons of leafy vegetables do you consume?"*, and *"On a typical day, how many tablespoons of non-leafy vegetables do you consume?*" The amounts reported in household measures were converted into daily portions, and the values for the consumption of leafy vegetables and non-leafy vegetables (vegetables in general) were added.[17]

The consumption of ultra-processed foods was assessed using a food frequency questionnaire (FFQ) covering the six months prior to the interview. The investigated markers were selected based on the most consumed foods by the Brazilian population, according to the 2017-2018 Household Budget Survey[18] and the 2013 National Health Survey,[19] thus aligning with population-based national studies. It should also be noted that all selected consumption markers are included in the NOVA Food Frequency Questionnaire (NovaFFQ), which has been recently validated for Brazilian adults.[20]

The consumption of the following food groups was assessed: cream-filled cookies (any flavor/brand); sweets (candies/chocolates/lollipops/other confectionery); savory snacks (homemade fried or baked items, or those purchased/consumed away from home); soft drinks (any flavor/brand of regular sugar-sweetened versions); and powdered drink mixes (any flavor/brand of regular sugar-sweetened versions). Food consumption frequency for each food group was categorized as either daily/weekly or monthly/rare/never.

Perception of F&V purchasing and preparation was assessed through agreement/disagreement with the statements: "*I have time to purchase fruits, leafy vegetables, and non-leafy vegetables*" and "*Preparing fruits, leafy vegetables, and non-leafy vegetables would be easy and quick for me*." Knowledge of the food season was assessed by the question "*Do you know what seasonality is?*", with the answer options: yes or no.

Statistical analysis

Data tabulation and database consistency analysis were performed by trained nutritionists using *Access* version 10.0, and Stata *software* version 14.0 was used for statistical analyses. All analyses considered a significance level of 5%.

Categorical variables were expressed as absolute and relative frequencies. The numerical variables, after checking the normality of the data using the Shapiro-Wilk test, were presented as median and interquartile range (P_{25}-P_{75}).

The factors associated with the responsibility for food purchasing and/or preparation were initially assessed using Chi-square and Mann-Whitney tests (for categorical and numerical variables, respectively).

After multicollinearity analysis, variables associated with the outcome in bivariate analysis (p<0.20) were included in the Multiple Logistic Regression model in three blocks (sociodemographic/food consumption/perception of F&V purchase and preparation) using backward method, presenting *Odds Ratio* (OR) values and their respective 95% confidence intervals (95%CI). Model fit was assessed using the Hosmer-Lemeshow test, which ranges from 0 to 1, with values closer to 1 indicating better model fit.[21]

Ethical aspects

The study was approved by the Research Ethics Committees of the Federal University of Minas Gerais (Opinion No. 0537.0.0203.000-11) and the Belo Horizonte City Hall (Opinion No. 0537.0.0203.410-11A).

RESULTS

Among the 3,300 participants, most were female (88.0%), adults (56.4%), had a partner (61.7%), and had completed primary education (50.3%) (Table 1).

Nearly all participants (90.5%) reported being responsible for purchasing and/or preparing food at home, which was associated with the following sociodemographic characteristics: being female (92.9% *vs.* 73.0% for males; p<0.001), having a partner (91.4% *vs.* 89.2% without partner; p=0.043), and being a homemaker (93.3% *vs.* 90.3% retired/pensioners; 88.5% other occupations; p=0.001) (Table 1).

Table 1. Sociodemographic profile of those responsible for purchasing and/or preparing food. Belo Horizonte-MG - 2013/2014.

Variables	Total (n=3,300)		Not responsible* (n=312)		Responsible* (n=2,988)		p-value
	n	Indicator	n	Indicator	n	Indicator	
Sex (%)							
Male	396	12.0	106	27.0	290	73.2	<0.001[1]
Female	2,904	88.0	206	7.1	2,698	92.9	
Age (%)							
Adults	1,861	56.4	185	9.9	1,676	90.1	0.278[1]
Elderly	1,349	43.6	127	8.8	1,312	91.2	
Marital status (%)	1,263						
Unpartnered	2,036	38.3	136	10.8	1,127	89.2	0.043[1]
Partnered		61.7	176	8.6	1,860	91.4	
Occupation (%)							
Homemaker	951	28.8	64	6.7	887	93.3	0.001[1]
Retired/pensioner	1,218	36.9	118	9.7	1,100	90.3	
Other	1,131	34.3	130	11.5	1,001	88.5	
Education level (%)							
< 8 years	1,661	50.3	153	9.2	1,508	90.8	0.092[1]
8 to 11 years	1,356	41.1	122	9.0	1,234	91	
12 years or older	283	8.6	37	13.05	246	86.95	
Monthly per capita family income (R$)[3]	3,018	678.00 (425.00; 1,000.00)	279	678 (406.80; 1,250.00)	2,739	678 (428.57; 1,000.00)	0.978[2]

Note: *n* refers to the total number of responses in each category. Indicator refers to frequency for categorical variables or median and interquartile range (P_{25}-P_{75}) for numerical variables. Number of participants who did not answer the questions: marital status (n=1), education level (n=1) and income (n= 282).

*Responsible or not for purchasing or preparing food. 1[1]Chi-Square test, [2]Mann-Whitney test; [3]Minimum wage at the time: R$ 678.00

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Regarding food consumption, individuals responsible for purchasing and/or preparing meals showed higher regular intake of fruits (69.8% *vs.* 60.6%; p<0.001) and vegetables (80.8% *vs.* 73.7%; p=0.001), and lower prevalence of weekly or daily consumption of cream-filled cookies (6.9% *vs.* 11.4%; p=0.004), savory snacks (15.6% *vs.* 24.3%; p<0.001), and soft drinks (36.6% *vs.* 47.2%; p<0.001). In addition, they reported having seasonal food knowledge (75.6% *vs.* 69.5%; p=0.018), having time to purchase F&V (67.7% *vs.* 56.6%; p<0.001) and considering easy and quick to prepare these foods (62.6% *vs.* 49.7%; p<0.001) (Table 2).

Table 2. Food consumption, perceptions, and knowledge on food purchasing and preparation by responsibility for purchasing and/or preparing food. Belo Horizonte-MG - 2013/2014.

Variables	Total		Not responsible *		Responsible *		p-value
	n	Indicator	n	Indicator	n	Indicator	
Fruit and vegetables							
Fruit consumption (%)¶							
Irregular	996	30.2	122	39.1	874	29.3	**<0.001**
Regular	2,303	69.8	190	60.6	2,113	70.1	
Daily portions of fruit	3,264	2.0 (2.0; 3.0)	307	2.0 (2.0; 3.0)	2,957	2.0 (2.0; 3.0)	0.093
Vegetable consumption (%)¶							
Irregular	633	19.2	82	26.3	551	18.4	**0.001**
Regular	2,666	80.8	230	73.7	2,436	81.6	
Daily portions of vegetables	3,293	2.0 (1.5; 2.5)	310	2.0 (1.5; 2.8)	2,983	2.0 (1.5; 2.5)	0.855
Consumption of ultra-processed foods							
Cream-filled cookies (%)							
Daily/Weekly	241	7.4	35	11.4	206	6.9	**0.004**
Monthly/Rarely/Never	3,031	92.6	272	88.6	2,759	92.1	
Sweets (%)							
Daily/Weekly	1,3240	40.4	131	42.7	1,193	40.2	0.398
Monthly/Rarely/Never	1,952	59.6	176	57.3	1,776	59.8	
Salty snacks (%)							
Daily/Weekly	539	16.4	75	24.3	464	15.6	**<0.001**
Monthly/Rarely/Never	2,476	83.6	234	75.7	2,512	84.4	
Soft drinks (%)							
Daily/Weekly	1,235	37.6	146	47.2	1,089	36.6	**<0,001**
Monthly/Rarely/Never	2,046	62.4	163	52.8	1,883	63.4	
Powdered soft drinks (%)							
Daily/Weekly	945	28.9	91	29.5	854	28.8	0.784
Monthly/Rarely/Never	2,328	71.1	217	70.5	2,111	71.2	
Perceptions and knowledge							
Have time to purchase F&V (%)							
Strongly disagree/Somewhat disagree	1,088	33.3	134	43.4	954	32.3	**<0.001**
Strongly agree/Agree/Slightly agree	2,179	66.7	175	56.6	2,004	67.7	
It is easy and quick to prepare F&V (%)							
Strongly disagree/Somewhat disagree	1,264	38.6	155	50.3	1,109	37.4	**<0.001**
Strongly agree/Agree/Slightly agree	2,009	61.4	153	49.7	1,856	62.6	
Familiar with the concept of seasonality of foods (%)							
No	825	25	95	30.5	730	24.4	**0.018**
Yes	2,473	75	216	69.5	2,257	75.6	

Note: *n* refers to the total number of responses in each category. Indicator refers to frequency for categorical variables or median and interquartile range (P_{25}-P_{75}) for numerical variables. F&V: Fruit and vegetables.

¶ Regular consumption: ≥5 days/week; irregular: ≤4 days/week; *Responsible or not for buying and/or preparing food. [1]Chi-square test,[2]Mann-Whitney test;

Multivariate analysis revealed that women were 5.42 times more likely to be responsible for food purchasing and/or preparation compared to men (OR=5.42; 95%CI:4.10-7.16). The likelihood was 58% higher among partnered individuals (OR=1.58; 95%CI:1.23-2.04), 37% higher among those who found it easy and quick to prepare F&V (OR=1.37; 95%CI:1.06-1.77), and 43% higher among those who reported having time to purchase these foods (OR=1.43; 95%CI:1.10-1.87). Moreover, it was 46.0% higher among those who knew the concept of seasonality of foods (OR=1.46; 95%CI:1.11-1.87) and 48.0% higher among participants who consumed soft drinks less frequently (OR= 1.48; 95%CI:1.16-1.90) (Table 3).

Table 3. Final model for factors associated with responsibility for purchasing and/or preparing foods. Belo Horizonte-MG, 2013-2014.

Variables	*Odds Ratio**	95%CI	p-value
Sex (%)			
Male	1	-	<0.001
Female	5.42	4.10-7.16	
Marital status (%)			
Unpartnered	1	-	<0.001
Partnered	1.58	1.23-2.04	
Soft drink consumption (%)			
Daily/Weekly	1	-	0.002
Monthly/Rarely/Never	1.48	1.16-1.90	
It is easy and quick to prepare F&V (%)			
Strongly disagree/Somewhat disagree	1	-	0.018
Strongly agree/Agree/Slightly agree	1.37	1.06-1.77	
Have time to purchase F&V (%)			
Strongly disagree/Somewhat disagree	1	-	0.008
Strongly agree/Agree/Slightly agree	1.43	1.10-1.87	
Familiar with the concept of seasonality of foods (%)			
No	1	-	0.006
Yes	1.46	1.11-1.91	

Note: *Multiple Logistic Regression. *Backward* method. Model fit: Hosmer and Lemeshow test: p=0.843.

DISCUSSION

Responsibility for household food purchasing and/or preparation was associated with sociodemographic characteristics, food consumption, and perceptions regarding the purchase and preparation of F&V. Being female, having a partner, reporting lower soft drink consumption, having knowledge about seasonal foods, having time for purchasing, and considering F&V preparation easy and quick were positively associated factors.

Being female increased by more than fivefold the likelihood of being responsible for food purchasing and/or preparation. This finding confirms women's predominant role in household duties and family caregiving. Historically, women have been responsible for daily care work (food preparation, cleaning, household management and organization, assistance to dependent individuals), regardless of whether it is paid work or not. In Latin America and the Caribbean, women spend three times more time than men on unpaid care work.[22,23] In Brazil, women devote 9.6 more hours per week than men to these tasks.[24]

This scenario results in physical and mental overload for women who often balance caregiving responsibilities with work outside the home and/or education.[25,26] In Brazil, even among women working outside, the weekly time devoted to household activities was, on average, 6.8 hours higher compared to men.[24] The impacts of this predominantly female care model are even more pronounced among women with

lower income and education, Black women, and those living in areas with limited access to public services. This imposes significant barriers to their rights, such as rest, leisure, education, and labor market participation, compromising their physical and mental health, income generation, and financial autonomy.[2,22,23,25,26]

The literature also indicates that being female is associated with greater CS.[5] A study conducted with Latino youth in the United States (USA) revealed that females acquire CS earlier and more prevalently than males, leading to disparities in responsibilities and opportunities even before adulthood.[27] Higher prevalence of women who cook is observed across different countries. In the USA, women spent 52.2% more time cooking than men, dedicating 2.5 times more hours to this task.[28] In Spain, women were seven times more likely to perform more than half of all culinary activities.[29] In Brazil, 95.5% of women were responsible for food preparation, serving, table setting, and dishwashing, *vs.* 60.8% of men.[24]

Conversely, food purchasing and/or preparation may serve as protective factors for women's health by fostering CS and promoting greater autonomy in food choices.[1,2] However, there is an undeniable need for better distribution of domestic labor and the development or enhancement of CS among all household members to ensure shared responsibility for the family's adoption of healthy habits.[2,29] This urgent transformation is already underway, as evidenced in the USA, where the percentage of college-educated men who cook increased from 37.9% to 51.9% between 2003 and 2016.[28] Nevertheless, this phenomenon, known as the "masculinization of cooking," is partly attributed to the increased visibility and prestige of male *chefs*, framing cooking as a *status* activity, hobby, and entertainment rather than a daily necessity or obligation.[28,30]

Nevertheless, even when men report being responsible for food purchasing and/or preparation, as investigated in this study, they are likely only in charge of food purchasing, while women, due to social aspects and greater CS, generally remain responsible for planning what, where, and when food will be purchased and consumed by the family.[31] A study conducted in Chile with adult workers during the COVID-19 pandemic showed that the prevalence of food purchasing responsibility was proportionally higher among men compared to women.[27] This scenario may also reflect historically shaped gender roles, where men are responsible for the family's financial provision and activities outside the home, including purchasing food and other items.[27,31]

Similar to findings by Virudachalam et al.[28] in the USA, partnered individuals reported greater responsibility for food purchasing and/or preparation. Living alone may hinder meal preparation and be associated with reduced cooking motivation.[4,32-35] However, this positive association may also reflect the prevailing patriarchal structure in Brazil, where women traditionally assume domestic tasks.[25] Supporting this hypothesis, this study found a higher prevalence of men who reported having a partner and less responsibility for food purchasing and/or preparation (74.5% *vs.* 60.0% among women; $p<0.001$ - data not shown). National data corroborates these results, indicating that among Brazilians with a partner, 58.9% of men reported being responsible for preparing or serving food, setting the table or washing dishes, as opposed to 97.5% of Brazilian women.[24]

Regarding food consumption, only the lower frequency of soft drink consumption was associated with responsibility for food purchasing and/or preparation. This finding highlights soft drinks' role as an UPF indicative of unhealthy dietary patterns,[1,2] with the relationship between consumption and CS also documented in other studies.[1,6,36] Limited involvement in food purchasing and/or preparation may lead to increased consumption of ready-to-eat foods, such as *fast food*, typically accompanied by sweetened beverages such as soft drinks, particularly when eating out.[2,31] Conversely, having CS and engaging in food

preparation and/or purchasing activities may be associated with more mindful and healthier food choices, potentially resulting in increased consumption of foods indicative of a healthy diet.[28,37]

In this context, Monsivais et al.[8] found that individuals who spent more time preparing meals were more likely to consume vegetables, fruits, and fruit juices among the North American individuals. In the United Kingdom, Lam & Adams[6] found that adults with higher CS who used them frequently consumed fewer UPF. In Brazil, analyses of a NutriNet-Brasil cohort subsample revealed that planning and engaging in food purchasing and preparation practices were associated with better diet quality.[1] However, this study found no significant association with F&V consumption, which are markers of an adequate and healthy diet.

In a context of multitasking and widespread availability of convenient UPF and out-of-home meals, perceived time scarcity was associated with reduced responsibility for food purchasing and/or preparation, corroborating literature that identifies lack of time as a significant barrier to cooking, associated with increased consumption of out-of-home meals.[2,8,23,33,38] In Brazil, expenditure on out-of-home meal consumption increased from approximately 25% of total household food expenses in 2002-2003 to 33% in 2019.[39,40] To address this trend, there has been growing emphasis on cooking as a strategy for promoting an adequate and healthy diet.[1,2,11,30] In Japan, individuals reporting lower CS were less likely to consume home-prepared meals, with women in this category also showing reduced F&V consumption.[41]

Beyond fostering autonomy, developing CS integrates technical and traditional knowledge.[2] In this context, diverse forms of expertise, such as understanding F&V seasonality, can enhance individuals' self-efficacy in purchasing, preparing, and consuming these foods while contributing to reduced food expenditure. Seasonal foods are more affordable, tastier, more nutritious, and contain fewer pesticides. Thus, understanding seasonal food availability could help reduce barriers to CS development.[2,42,43] However, it is worth noting that the relationship between seasonal food knowledge and responsibility for food purchasing and/or preparation could also be explained inversely, as individuals with greater CS might be more inclined to seek information about food prices and quality. This is therefore a possible bias of the cross-sectional design, preventing establishing a causal relationship between the events.[7]

Another aspect to consider when interpreting the results is that the study was conducted in a PHC setting, with a sample predominantly composed of women, which may limit generalizability to the general population. However, in 2023, 77.6% of the Brazilian population was covered by PHC,[44] and women are the main users of these services,[45] making these findings relevant for targeting actions to promote an adequate and healthy diet.

Another limitation concerns the format of the question and answer options regarding responsibility for purchasing and/or preparing food, which did not allow distinguishing between participants who were only responsible for purchasing or preparing meals in the household. The investigation of responsibilities through separate analyses, using specific questions for each attribution of interest or non-dichotomous questions, could yield more accurate results and enhance understanding of the specific roles played by different population subgroups, particularly regarding comparisons between men and women.

Furthermore, the use of non-specific questionnaires to estimate food consumption according to the NOVA classification, and CS, such as the QFA-Nova[20] and the *Brazilian Cooking Skills and Healthy Eating Questionnaire* (BCSQ),[46] that were not available at the time of data collection, also constitutes a potential limitation. The use of specific questionnaires could provide more detailed results regarding these variables However, it is worth noting that the adopted markers are included in the QFA-Nova, validated for Brazilian adults and based on population-based surveys (POF and PNS),[18,19] which reinforces the quality of the instrument and likely minimizes the potential impact of this limitation.

This study stands out for its significant sample size and representativeness, contributing to the body of evidence regarding the relationship between CS, increased confidence in purchasing and preparing F&V, and lower frequency of UPF consumption. Furthermore, this study advances the discussion on gender inequalities in food-related tasks, focusing on PHC services.

CONCLUSION

The responsibility for pre-meal practices, such as food preparation and/or purchasing, was associated with sociodemographic characteristics, dietary intake, and perceptions about purchasing/preparing F&V, with notably higher prevalence among women. These findings underscore the need for shared household responsibilities and the enhancement of CS across genders and population subgroups to foster autonomy in making healthier food choices.

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