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Food consumption of users of the Brazilian Unified Health System by type of assistance and participation in the "Bolsa Família"

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Abstract *A cross-sectional study was conducted to evaluate and compare dietary intake, type of assistance (Basic Health Units – UBS and Family Health Strategies – ESF) and participation in the "Bolsa Família" Program (PBF) among users of the Brazilian Unified Health System, (SUS). The sample was composed of individuals of both sexes between 18 and 78 years of age in Porto Alegre, state of Rio Grande do Sul. Socioeconomic, clinical and food consumption data were collected via a questionnaire adapted from the SISVAN and VIGITEL national surveys. The analyses were conducted using R3.1 software. Of the 187 patients, 91 were affiliated to the ESF, 96 to UBS and 40 were registered with the PBF. A healthy eating pattern was identified in only 41% of SUS users. It was observed that 55% did not consume raw salad (37% p = 0.04) and vegetable consumption was lower among the PBF users (67.5% versus 75.9%; p = 0.02). There was no significant difference in food consumption considering the kind of assistance (ESF or UBS). A healthy consumption pattern was not associated with demographic and socioeconomic variables. The majority of beneficiaries of the PBF did not admit to healthy eating patterns. Therefore, effective health promotion and prevention is needed for this population, mainly among the beneficiaries of the PBF.*

Key words *Food consumption, Unified health system, Primary health care*

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Introduction

Since 1998, the World Health Organization (WHO) has proposed food recommendations for populations should be focused on food rather than on nutrients[1]. Since then, many studies have focused on the assessment of food intake of populations, observing food items consumed[2-5].

National family budget surveys *(Pesquisas de Orçamentos Familiares* – POF) in Brazil have demonstrated the Brazilian population's food pattern is characterized by the habitual consumption of rice and beans, along with high consumption of high caloric value and low nutritional value food items[6]. This pattern represents a nutritional consumption transition in which food shortage has been replaced by the excess of foods with little nutritional value. This habit contributes to the increase of overweight and obesity of the population, as well as the increase of Non-communicable Chronic Diseases (NCDs)[7,8].

In this context, the *Bolsa Família* Program (BFP – a financial support program for low-income families) has been implemented in Brazil to guarantee the human right to adequate food and to promote food and nutritional security. BFP is an income transfer program which contributes to the achievement of citizenship of the population that is most susceptible to hunger, poverty and extreme poverty[9]. The main objective of BFP is to combat hunger and promote food security, especially in families with children and pregnant women who are in situation of extreme poverty (R$ 77.00 – approximately US$ 20 [US$ 1.00 = R$ 3.87, on June 27th 2018] – monthly income per person).

However, an increase in income does not necessarily lead to a healthier diet. It has been demonstrated the higher purchasing power of poor families the higher the consumption of unhealthy food[10]. An evaluation of the Brazilian Institute of Social and Economic Analysis reached the same conclusion shown by POF data of families benefited by BFP. These data have identified a trend of increase in the consumption of animal proteins, milk and dairy products; increased consumption of biscuits, oils and fats, sugars and processed foods; and, to a lesser extent, an increase in the consumption of vegetables[11].

Insufficient consumption of fruits and vegetables (FV) is among the top ten risk factors for diseases worldwide and an estimated 2.7 million lives could be saved annually worldwide if the consumption of FV was adequate[12], which reinforces the importance of evaluating food intake to implement corrective measures in food intake pattern of a population.

In the context of corrective measures and public policies, the Ministry of Health created the *Programa Saúde da Família* (Family Health Program), which has been implemented as Family Health Strategy (FHS), with the aim of strengthening primary health care and acting more actively on populations of greater vulnerability[13]. In addition, the strategy aims to replace the traditional model of health care in the country, the Basic Health Units (BHU), reorganizing this way the *Sistema Único de Saúde* (SUS - Unified Health System), prioritizing comprehensive health care, preventing, promoting and recovering the health of individuals in a complete and continuous way[14]. In FHS, a multi professional team serves a defined population which belongs to a limited area. However, it is still unclear whether the type of assistance has an impact on some health conditions of the population, such as food intake pattern.

It is worth mentioning, even with the assistance of the *Núcleos de Apoio à Saúde da Família* (NASF - Family Health Support Teams) which contribute to the expansion and improvement of health care and management[15] within the FHS, dietitians are not legally required members of these supporting teams. However, when dietitians are present, prevention of poor diet and unhealthy lifestyle is reinforced with the addition of measures such as correction of nutritional deficiencies and prevention or treatment of NCDs[15].

In view of the above, the objective of this study was to assess SUS users food intake according to the type of assistance received - conventional care model (BHU) and assistance model (FHS) - and according to the participation in *Bolsa Família* Program.

Methods

A cross-sectional study was conducted with individuals of both sexes who were 18 years of age or older and were SUS users from Porto Alegre-RS / Brazil. Two FHS units (*Esperança Cordeiro* and *São Borja*) were selected, which had a complete team. Two other traditional units, among which there were equivalent teams (BHU *Santa Rosa* and *São Cristóvão*) were also selected. A convenience sample was used, and the individuals were invited to participate in the waiting room of the health units, in different shifts (morning and afternoon). All interviews were conducted by the

Ciência & Saúde Coletiva, 23(8):2599-2608, 2018

same researcher, from November 2012 to May 2013. All adult individuals who attended those health units during the period of data collection were considered eligible for the study.

A questionnaire was developed for data collection. It contained questions on socioeconomic aspects such as family income (minimum wage), marital status (single, married, others), race / self-referred skin color (black, brown, white indigenous and others), schooling (years of study) and employment status. In addition to dietary intake and participation in the *Bolsa Família* program, data on self-reported hypertension and diabetes were also collected[16].

For food intake assessment a structured evaluation from the food frequency questionnaire of the *Sistema de Vigilância Alimentar e Nutricional* (SISVAN - Food and Nutrition Surveillance System)[17] was used, with the addition of food items regurlarly used to evaluate food consumption by the *Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônicas* (VIGITEL - Surveillance of Risk Factors and Protection for Chronic Diseases by Telephone Inquiry)[18]. The evaluation of food consumption was performed in relation to the weekly food frequency and regular consumption as described below:

Weekly food frequency: it was analyzed according to SISVAN food consumption marker[17]. Healthy eating was characterized when the individual reported daily consumption of beans, fruits, vegetables and milk or skimmed or semi-skimmed yogurt and / or fish consumption at least once a week. . An inadequate diet was characterized by frequent consumption of fried foods and snacks such as chips, crisps, fried salads, salty crackers or packet snacks, sweet or sandwich biscuits, sweets, candy and chocolates, canned food and soft drinks.

Regular food consumption: The VIGITEL survey[18] was used for this evaluation. The consumption on at least five days per week of fruit (including consumption of natural fruit juice), vegetables (raw salads, cooked vegetables and vegetables) and beans was considered healthy. The habit of consuming meat with excess fat, such as red meat with fat or chicken with skin, and the habit of consuming whole milk, soft drinks of any type and artificial juices on five or more days per week was considered unhealthy food consumption.

The variable "healthy eating pattern" was created for the global evaluation of food intake. It combined food item considered healthy (fruit, vegetables and beans) when consumed at the recommended frequency (five or more times a week), according to VIGITEL [18].

Relative and absolute frequencies were calculated, and univariate analysis was performed to observe differences between categories. Qui-square test or Fisher's exact test were performed. Differences between means were tested with Student's t-test. Statistical analyses were performed using software R 3.1. The level of significance adopted was $p < 0.05$ and a 95% confidence interval was adopted.

The present study was approved by the Research Ethics Committee of the Municipal Health Department of Porto Alegre. All included subjects signed a free and informed consent form after being informed about the nature of the study, having endorsed all the ethical precepts of Resolution CNS 196/96.

Results

The study population consisted of 187 individuals, mostly women (80%). Ninety-one participants (49%) belonged to Family Health Strategy (FHS) and 96 (51%) to Basic Health Units (BHU). Forty participants (21.4%) benefited from the *Bolsa Familia* Program (BFP). Results of socioeconomic variables are presented in Table 1. FHS participants presented lower level of schooling ($p = 0.02$) and higher participation in BFP ($p = 0.02$). Individuals participating in BFP were predominantly of non-white ethnicity, differently from those not participating in the income transfer program ($p = 0.04$).

Regarding regular food intake analyses, as classified by VIGITEL (Table 2), 41% of participants presented healthy food consumption. Healthy food consumption was reported for vegetables (74%), beans (72%) and fruits (68%). Unhealthy food intake was reported for milk or full fat yogurt (54%), meat with fat (39%) and soda or artificial juices (29%).

When comparing the frequency of healthy food consumption among BFP beneficiaries, the majority (55%) did not consume raw salad compared to those who did not receive the benefit (36.6%; $p = 0.04$). Consumption of vegetables was lower among BFP beneficiaries than non-beneficiaries (67.5% and 75.9%, respectively, $p = 0.02$). The pattern of healthy consumption was not associated with demographic or socioeconomic variables (Table 3).

Table 1. Sociodemographic characteristics of 187 SUS users according to the type of assistance received. Porto Alegre, 2014.

	Total (n = 187)		FHS (n = 91)		BHU (n = 96)		p value	BFP (n = 40)		NO BFP (n = 145)		p value
	n	%	n	%	n	%		n	%	n	%	
Age (years)												
18 to 24	19	10.2	9	9.9	10	10.4		5	12.5	13	9	
25 to 34	36	19.2	17	18.7	19	19.8		11	27.5	25	17.2	
35 to 44	45	24.1	18	19.8	27	28.3		9	22.5	35	24.1	
45 to 54	32	17.1	16	17.6	16	16.7		8	20	24	16.6	
55 to 64	37	19.8	22	24.2	15	15.6		7	17.5	30	20.7	
over 65	18	9.6	9	9.9	9	9.4	0.67	0	0	18	12.4	0.11
Sex												
Female	127	67.9	57	62.6	70	72.9		32	80	95	65.5	
Male	60	32.1	34	37.4	26	27.1	0.18	8	20	50	34.5	0.2
Race/Ethnicity												
Black	45	24.1	24	26.4	21	21.9		15	37.5	29	20	
Brown	30	16	20	22	10	10.4		9	22.5	21	14.5	
White	91	48.7	38	41.8	53	55.2		11	27.5	79	54.5	
Indigenous	5	2.7	3	3,3	2	2.1		1	2.5	4	2.8	
Not informed	16	8.6	6	6.6	10	10.4	0.13	4	10	12	8.3	0.04*
Schooling (years)												
Did not study	11	5.9	7	7.7	4	4.2		4	10	7	4.8	
under 8	88	47.1	50	55	38	39.6		22	55	64	44.1	
9 to 12	79	42.3	33	36.3	46	47.9		14	35	65	44.8	
over 12	9	4.8	1	1.1	8	8.3	0,02*	0	0	9	6.2	0.07
Income (in Brazilian minimum wage salaries)												
under 1	16	8.6	9	9.9	7	7.3		6	15	10	6.9	
1 to 5	134	71.7	63	69.2	71	74		27	67.5	106	73.1	
over 5	8	4.3	3	3.3	5	5.2	0.78	0	0	7	4.8	0.31
Bolsa Família Program												
Yes	40	21.4	26	28.6	14	14.6		14				
No	145	77.5	63	69.2	82	85.4	0.02*	12	-	-	-	
Civil Status								14	-	-	-	
Single	47	25.1	21	23.1	26	27.1			35	32	22.1	
Married	76	40.6	33	36.3	43	44.8		16	30	63	43.5	
Other	64	34.2	37	40.7	27	28.1	0.18	24	35	50	34.5	0.18
Employment												
Yes	84	44.9	38	41.8	46	47.9		16	40.0	66	45.5	
No	103	55.1	53	58.2	50	52.1	0.4	24	60.0	79	54.5	0.66
Diabetes												
Yes	27	14.4	14	15.4	13	13.5		7	17.5	20	13.8	
No	159	85.0	76	83.5	83	86.5	0.55	33	82.5	124	85.5	0.67
Hypertension												
Yes	58	31.0	32	35.2	26	27.1		11	27.5	47	32.4	
No	128	68.5	59	64.8	69	71.9	0.32	29	72.5	97	66.9	0.64

SUS = Brazilian Unified Health System/ FHS = Family Health Strategies; BHU = Basic Health Units; BPF = *Bolsa Família* Program

* Chi-squared test.

Discussion

This study found the majority of the population evaluated did not report a healthy eating pattern. In addition, *Bolsa Família* Program beneficiaries presented less healthy eating habits than non-beneficiaries. There was no association

Ciência & Saúde Coletiva, 23(8):2599-2608, 2018

Table 2. Frequency of food consumption, according to VIGITEL criteria, of 187 SUS users according to the type of assistance received. Porto Alegre, 2014.

	Total (n = 187)		FHS (n = 91)		BHU (n = 9)		p value	BFP (n = 40)		NO BFP (n = 145)		p value
	n	%	n	%	n	%		n	%	N	%	
Healthy eating pattern												
No	110	58.8	49	53.9	61	63.5		22	55.0	87	60.0	
Yes	77	41.2	42	46.2	35	36.5	0.19	18	45.0	58	40.0	0.39
Salad												
Not healthy: 0 to 4 times per week	76	40.6	40	44.0	36	37.5		22	55.0	53	36.6	
Healthy: 5 or more times per week	111	59.4	51	56.0	60	62.5	0.29	18	45.0	92	63.5	0.04*
Cooked Vegetables												
Not healthy: 0 to 4 times per week	117	62.6	58	63.7	59	61.5		28	70.0	88	60.7	
Healthy: 5 or more times per week	70	37.4	33	36.3	37	38.5	0.75	12	30.0	57	39.3	0.28
Vegetables												
Not healthy: 0 to 4 times per week	48	25.7	27	29.7	21	21.9		13	32.5	35	24.1	
Healthy: 5 or more times per week	139	74.3	64	70.3	75	78.1	0.22	27	67.5	110	75.9	0.02*
Fresh fruits or fruit salad												
Not healthy: 0 to 4 times per week	79	42.3	40	44.0	39	40.6		20	50.0	57	39.3	
Healthy: 5 or more times per week	108	57.8	51	56.0	57	59,4	0.76	20	50.0	88	60.7	0.20
Natural squeezed fruit juice												
Not healthy: 0 to 4 times per week	136	72.7	63	69.2	73	76.0		28	70.0	107	73.8	
Healthy: 5 or more times per week	51	27.3	28	30.8	23	24.0	0.38	12	30.0	38	26.2	0.57
Fruits and natural squeezed fruit juice												
Not healthy: 0 to 4 times per week	59	31.6	29	31.9	30	31.3		13	32.5	45	31.0	
Healthy: 5 or more times per week	128	68.4	62	68.1	66	68.8	0.52	27	67.5	100	69.0	0.34
Fruits and Vegetables												
Not healthy: 0 to 4 times per week	86	46.0	43	47.3	43	44.8		22	55.0	64	43.5	
Healthy: 5 or more times per week	101	54,0	48	52.7	53	55.2	0.26	18	45.0	83	56.5	0.53
Beans												
Not healthy: 0 to 4 times per week	52	27.8	25	27.5	27	28.1		11	27.5	41	28.3	
Healthy: 5 or more times per week	135	72.2	66	72.5	69	71.9	0.92	29	72.5	104	71.7	0.92
Skimmed or low fat milk or yogurt												
Not healthy: 0 to 4 times per week	175	93.6	86	94.5	89	92.7		38	95.0	135	93.1	
Healthy: 5 or more times per week	12	6.4	5	5.5	7	7.3	0.17	2	5.0	10	6.9	0.06
Lean red meat												
Not healthy: 0 to 4 times per week	137	73.3	64	70.3	73	76.0		31	77.5	105	72.4	
Healthy: 5 or more times per week	50	26.7	27	29.7	23	24.0	0.38	9	22.5	40	27.6	0.52
Chicken without skin												
Not healthy: 0 to 4 times per week	153	81.8	75	82.4	78	81.3		33	82.5	118	81.4	
Healthy: 5 or more times per week	34	18.2	16	17.6	18	18.8	0.84	7	17.5	27	18.6	0.82
Fish												
Not healthy: 0 times per week	102	54.5	50	54.9	52	54.2		22	55.0	78	53.8	
Healthy: 1 or more times per week	85	45.5	41	45,1	44	45.8	0.91	18	45.0	67	46.2	0.29
Whole milk or yogurt												
Not healthy: 1 or more times per week	101	54.0	52	57.1	49	51.0		26	65.0	73	50.3	
Healthy: no time in the week	86	46.0	39	42.9	47	49.0	0.33	14	35.0	72	49.7	0.07
Fried food												
Not healthy: 1 or more times per week	81	43.3	37	40.7	44	45.8		18	45.0	62	42.8	
Healthy: no time in the week	106	56.7	54	59.3	52	54.2	0.81	22	55.0	83	57.2	0.31
Biscuits or salty snacks												
Not healthy: 5 or more times per week	32	17.1	13	14.3	19	19.8		7	17.5	25	17.2	
Healthy: 0 to 4 times per week	155	82.9	78	85.7	77	80.2	0.32	33	82.5	120	82.8	0.97

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Table 2. Frequency of food consumption, according to VIGITEL criteria, of 187 SUS users according to the type of assistance received. Porto Alegre, 2014.

	Total (n = 187)		FHS (n = 91)		BHU (n = 9)		p value	BFP (n = 40)		NO BFP (n = 145)		p value
	n	%	n	%	n	%		n	%	N	%	
Cookies, sweets biscuits, candies and chocolates (bar or sugar plum)												
Not healthy: 5 or more times per week	25	13.4	13	14.3	12	12.5		7	17.5	17	11.7	
Healthy: 0 to 4 times per week	162	86.6	78	85.7	84	87.5	0.72	33	82.5	128	88.3	0.34
Soft drinks or artificial juices												
Not healthy: 5 or more times per week	54	28.9	29	31.9	25	26.0		15	37.5	38	26.2	
Healthy: 0 to 4 times per week	133	71.1	62	68.1	71	74.0	0.38	25	62.5	107	73.8	0.17
Hamburger and Sausages												
Not healthy: 5 or more times per week	48	25.7	25	27.5	23	24.0		11	27.5	35	24.1	
Healthy: 0 to 4 times per week	139	74.3	66	72.5	73	76.0	0.58	29	72.5	110	75.9	0.66
Red meat with visible fat												
Not healthy: 1 or more times per week	54	28.9	27	29.7	27	28.1		12	30.0	41	28.3	
Healthy: no time in the week	133	71.1	64	70.3	69	71.9	0.94	28	70.0	104	71.7	0.42
Chicken with skin												
Not healthy: 1 or more times per week	44	23.5	26	28.6	18	18.8		10	25.0	33	22.8	
Healthy: no time in the week	143	76.5	65	71.4	78	81.3	0.29	30	75.0	112	77.2	0.50
Meat with fat (meat or chicken)												
Not healthy: 1 or more times per week	72	38.5	38	41.8	34	35.4		16	40.0	56	38.1	
Healthy: no time in the week	115	61.5	53	58.2	62	64.6	0.23	24	60.0	91	61.9	0.96

VIGITEL = Surveillance of Risk Factors and Protection for Chronic Diseases by Telephone Inquiry[18]; SUS = Brazilian Unified Health System/ FHS = Family Health Strategies; BHU = Basic Health Units; BPF = *Bolsa Família* Program * Chi-squared test.

between food pattern and type of care received - conventional care model (BHU) or *Estratégia de Saúde da Família* (FHS - Family Health Strategy).

Users who belonged to FHS presented a lower level of schooling and higher frequency of BFP beneficiaries than those who belonged to the BHU, what is expected since FHS serves populations of greater social vulnerability. However, there was no difference in income level according to the type of assistance received. Considering that the majority of BFP beneficiaries belonged to FHS, the income transfer aid may be helping in this improvement, reducing social inequality. As income increases with BFP financial support, it is expected that there would be a greater purchase of food, including healthier foods. However, a review published in 2013 identified that BFP promotes an increase in access to food, but this is not necessarily accompanied by an increase in nutritional quality of food[10,19], which is in agreement with the results found in our study.

When comparing food intake frequency data of those receiving BFP to data from SISVAN in 2013, both nationally and in Rio Grande do Sul[20], or when comparing the same data to another study conducted in Porto Alegre[21], a higher frequency of daily consumption of canned food and soft drinks was observed in BFP beneficiaries in our study population. Daily frequencies of fruit, salad and vegetable intake were low in the studied population. These data are in the same line with SISVAN (2013) data and findings from another study conducted in Porto Alegre[20,21]. This trend has continued since the last POF in 2008-2009, which characterized the Brazilian eating habits as low in consumption of fruits and vegetables.

The improvement in total income enables a greater purchase of food but possibly because of low cost and marketing of industrialized foods with high caloric value and low nutritional value, these are more consumed by BFP beneficiary families. It is well known that income trans-

Table 3. Association of healthy eating pattern and demographic, socioeconomic variables of 187 SUS users. Porto Alegre, 2014.

	N	Healthy Eating Pattern				p value*
		Yes		No		
		n	%	n	%	
Age (years)						
18 to 24	19	11	10.0	8	10.0	0.69
25 to 34	36	24	21.8	12	21.8	
35 to 44	45	27	24.5	18	24.5	
45 to 54	32	20	18.2	12	18.2	
55 to 64	37	20	18.2	17	18.2	
over 65	18	8	7.3	10	7.3	
Sex						
Female	127	72	65,5	55	71.4	0.38
Male	60	38	34,5	22	28.6	
Race/Ethnicity						
Black	45	25	22.7	20	26.0	0.40
Brown	30	17	15.5	13	16.9	
White	91	57	51.8	34	44.2	
Indigenous	21	11	10.0	10	13.0	
Schooling (years)						
Did not study	1	1.1	0	0.0	1	0.64
under 8	47	49.5	28	45.2	47	
9 to 12	33	34.7	20	32.3	33	
over 12	14	14.7	14	22.6	14	
Income (Brazilian minimum wage salaries)						
under 1	1	1	1.0	0	0,0	0.71
1 to 5	149	90	93.8	59	95.2	
over 5	8	5	5.2	3	4.8	
Bolsa Família Program						
Yes	40	24	22.0	16	21.1	0.87
No	145	85	78.0	60	78.9	
Civil Status						
Single		31	28.2	16	20.8	0.39
Married		45	40.9	31	40.3	
Other		34	30.9	30	39.0	
Employment						
Yes		55	50.0	29	37.7	0.09
No		55	50.0	48	62.3	

* Chi-squared test.

fer programs alone cannot solve the problem of poverty and food insecurity. Therefore, the importance of associating the financial benefit with educational actions and nutritional assessment is reinforced[19].

Compared to data obtained in Porto Alegre by VIGITEL in 2013[18], a higher intake of meat with excess fat or without the removal of visible fat was observed in our sample. In addition, there was a higher regular consumption of soft drinks among BFP beneficiaries compared to the population evaluated in Porto Alegre by VIGITEL. In this analysis, Porto Alegre was classified as the third Brazilian capital with highest soft drink consumption. The POFs carried out in the period from 1974 to 2003 showed there was a 300%

increase in canned food intake and a 400% increase in soft drinks intake, in addition to verifying a 30% decrease in beans intake[22]. In the last POF analysis, between 2008 and 2009, consumption below recommended levels of fruits, vegetables and beans was observed, in addition to the increase in soft drinks consumption[6].

It should be noted that beans are considered a healthy food since they have high fiber content, in addition to their relatively low energy density. However, beans preparation should not include the addition of ingredients with a high fat content, which would increase the caloric value of the meal[18].

Inadequate diet is one of the risk factors for hypertension and diabetes. In our study sample, the prevalence of hypertension was approximately 10% higher among BFP recipients when compared to data from same year in Porto Alegre collected by VIGITEL[18]. Prevalence of self-reported diabetes was 100% higher than the one found by VIGITEL in Porto Alegre in 2013. Another fact shown by VIGITEL is that Porto Alegre is the second capital with more self-reported cases of diabetes, and the fourth in self-reported cases of systemic arterial hypertension.

Although our study comprised a convenience sample with a restricted number of volunteers benefiting from *Bolsa Família Program*, it was observed that the characteristics of the sampled population were very similar to the general population as reported by the *Instituto Brasileiro de Geografia e Estatística* (IBGE - Brazilian Institute of Geography and Statistics)[6]. Likewise, the large proportion of women in the sample reflects the greater search for assistance of women in health services, previously reported in the literature[23,24]. Another limitation is that the accumulation of other benefits was not investigated, which may have had an impact on family income, such as welfare benefits received by elderly people. In addition, a more detailed socioeconomic investigation was not performed, because of the impact it would have had on interview time. Finally, physiological issues such as oral diseases, use of prostheses, lack of teeth or other changes which might have had an impact on the choice of food (increasing the frequency of cooked foods and lowering the frequency of raw foods, for example) were not evaluated by the present study. However, in the case of receiving other benefits, or of physiological issues which could have altered the consistency of food, the results of this study become even more relevant when evidencing food choices.

Thus, data presented in this study indicate the need for preventive measures such as education and information on the acquisition of food for adequate nutrition, blood pressure control, diabetes and prevention of NCDs. In addition, public policies should emphasize actions which improve the availability of healthy food. It is a consensus that economic development needs to be linked to the health sector so that populations which benefit from an increase in income also have improved access to information and better health conditions[25]. Nevertheless, improvements in income must necessarily be linked to education and health promotion activities, aiming at a healthy diet.

Collaborations

J Silvani has worked in the research and development of all the work from research to writing; AF Recchi worked on the design and supervision of data collection, GG Pena worked on the critical analysis, formatting and writing of the final version, C Buss worked on data analyses, guidance, drafting the article and final review and EM Wendland worked on the design, statistical analysis, guidance and final review.

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