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Prevalence of use and sources of antihypertensive medicine in Brazil: an analysis of the VIGITEL telephone survey

Prevalência de uso e fontes de obtenção de medicamentos anti-hipertensivos no Brasil: análise do inquérito telefônico VIGITEL

Veronica Batista Gomes Leitão[I], Vivian Castro Lemos[I], Priscila Maria Stolses Bergamo Francisco[I], Karen Sarmento Costa[I]

ABSTRACT: ***Objective:*** The prevalence of hypertension in Brazil and worldwide has been increasing in recent decades, and drug therapy is one of the strategies used to control this condition. The objective of this study was to estimate the prevalence of use and identify the sources for obtaining antihypertensive drugs in Brazil, according to sociodemographic variables, comparing three periods: 2011, 2014 and 2017. ***Methods:*** Data from individuals aged ≥20 years who reported a medical diagnosis of hypertension, interviewed by Vigitel in 2011, 2014 and 2017 were used. Frequency and prevalence of drug use in addition to the sources for obtaining medication were estimated by sociodemographic variables, with 95% confidence intervals. The differences between proportions were verified by Pearson's chi-square test (Rao-Scott), with a significance level of 5%. ***Results:*** The prevalence of antihypertensive drug use remained stable (80%). Regarding the sources for obtaining these medicines, there was variation in the period, indicating a decrease in usage through the Brazilian Unified Health System (SUS) (44.2% in 2011; 30.5% in 2017). This decrease was accompanied with increase in PFPB (16.1% in 2011; 29.9% in 2017). The prevalence of other sources for obtaining medicine (private pharmacies/drugstores) showed stability in the period. ***Conclusions:*** The prevalence of medication use remained high and there was a change in the pattern of use according to sources, demonstrating migration between SUS pharmacies to the PFPB, and suggesting a reduction in the availability of medicines from public pharmacies universally, and for free.

Keywords: Drug Utilization. Health Services Accessibility. Hypertension. Behavioral Risk Factor Surveillance System.

[I]Department of Collective Health, Universidade Estadual de Campinas – Campinas (SP), Brazil.

Corresponding author: Veronica Batista Gomes Leitão. Rua Arlindo Agustinho de Lira, 1, Chácaras Gargantilha, CEP: 13098-837, Campinas (SP), Brasil. E-mail: vebgomes@gmail.com

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RESUMO: ***Objetivo:*** A prevalência de hipertensão arterial no Brasil e no mundo vem aumentando nas últimas décadas, sendo o uso de medicamentos uma das estratégias utilizadas no controle da doença. O objetivo deste estudo foi estimar a prevalência de uso e identificar as fontes de obtenção de anti-hipertensivos no Brasil, segundo variáveis sociodemográficas, comparando três períodos: 2011, 2014 e 2017. ***Métodos:*** Foram utilizados dados de indivíduos com idade ≥20 anos que referiram diagnóstico médico de hipertensão arterial, entrevistados pelo Vigitel nos anos de 2011, 2014 e 2017. Foi estimada a distribuição de frequências e as prevalências de uso de medicamentos, segundo variáveis sociodemográficas, de acordo com as fontes de obtenção, com intervalos de confiança de 95%. As diferenças entre as proporções foram verificadas pelo teste χ^2 de Pearson (Rao-Scott), com nível de significância de 5%. ***Resultados:*** A prevalência de uso manteve-se estável (80%). Quanto às fontes de obtenção observou-se variação no período, indicando diminuição na obtenção por meio das Unidades de Saúde do SUS (44,2% em 2011; 30,5% em 2017). Esse decréscimo esteve acompanhado do aumento na obtenção pela Farmácia Popular (16,1% em 2011; 29,9% em 2017). A prevalência de obtenção por meio de farmácias privadas/drogarias mostrou estabilidade no período. ***Conclusões:*** A prevalência de uso de medicamentos se manteve alta e houve modificação no padrão de utilização segundo fontes de obtenção, evidenciando migração entre Unidades de Saúde do SUS para a Farmácia Popular, sugerindo redução da disponibilidade dos medicamentos pelas farmácias públicas de forma universal e gratuita.

Palavras-chave: Uso de Medicamentos. Acesso aos Serviços de Saúde. Hipertensão. Sistema de Vigilância de Fator de Risco Comportamental.

INTRODUCTION

Chronic non-communicable diseases (NCDs) were responsible for 71% of a total of 57 million deaths worldwide in 2016[1,2] . Data from 2014 indicate that approximately 75% of deaths from NCDs occur in low- and middle-income countries, and 40% of them are considered premature deaths (before the age of 70)[3]. Arterial hypertension is the main risk factor for cardiovascular diseases and has an important impact on NCD mortality[4]. In Brazil, in 2016, more than 975 thousand deaths were attributed to NCDs, which represents 74% of the total deaths that year, 28% due to cardiovascular diseases[5].

The global prevalence of arterial hypertension in adults (≥ 18 years old) was around 22% in 2014, ranging from 30% in the African continent to 18% in the Americas[3]. According to data from the National Health Survey (*Pesquisa Nacional de Saúde* - PNS) of 2013, the prevalence of hypertension reported by the adult Brazilian population was 21.4%[6], results similar to those obtained by the Vigitel survey, which pointed to a prevalence of 22.7% in 2011, and reaching 24.3% in 2017. This study considered 27 cities[7-9] and indicated, therefore, that approximately one in four adults in Brazil is hypertensive.

The primary objective of the treatment of arterial hypertension is to reduce cardiovascular morbidity and mortality. As such, the proposed treatments should not only reduce blood pressure, but also reduce fatal and non-fatal cardiovascular events and, if possible, the mortality rate[10]. Appropriate management of hypertension is vital to alleviate possible disabilities and loss of quality of life. Additionally, it decreases health system costs, thus having

an important socioeconomic impact[4,11,12]. Therefore, a therapeutic approach includes measures without the use of antihypertensive drugs in order to reduce blood pressure, protect target organs and prevent cardiovascular and renal outcomes[5,11].

Based on the definition of health as a constitutional right, comprehensive therapeutic assistance, including free access to medicine is a universal guarantee of the Brazilian government[13,14]. Since 1998, the advancement of pharmaceutical assistance policies that ensure the population's access to medicine has become part of health priority agendas.[15-17] Among them include the promotion and expansion of free access through the SUS, which then motivated the creation of the Farmácia Popular do Brasil Program (PFPB). The PFPB initially only dealt with its own system, but then it started working in partnership with private pharmacies, inaugurating the co-payment system in the country in 2006, through the "Aqui Tem Farmácia Popular" (ATFP). The PFPB, instituted by Decree No. 5,090/2004, was created due to the need to promote universal access to medicine, and to reduce the impact of these expenses on families' budgets[18-22]. Since 2011, it has been providing free antihypertensive drugs in both types of health system. The sources for obtaining anti-hypertensive drugs in Brazil can be subdivided into private pharmacies and/or drugstores, where individuals pay in full; public pharmacies, primarily those in the public health units, whose financing comes from three institutions (Federal, State and Municipal) and through PFPB.

Providing adequate drug treatment for NCDs, including hypertension, in order to reduce early mortality from these diseases, is one of the objectives for sustainable development defined by the World Health Organization (WHO). It is supposed to be achieved by 2030[2]. Reports of anti-hypertensive drug use among hypertensive patients in Brazilian capital cities in 2013 was 81.4%[6], indicating that a large portion of individuals with this condition have been accessing the various networks in the country to obtain these drugs. In 2011, the Ministry of Health prepared a Strategic Action Plan for tackling NCDs (2011–2022), which provides the expansion of access to free medicines for hypertension and diabetes, among other measures[23]. In order to verify the effectiveness of these actions, it is necessary to monitor indicators, such as the use of medicines and where they are obtained, in order to identify the availability of free access to such medicines.

Vigitel is part of the Ministry of Health's surveillance system for NCD risk factors and in 2011, it incorporated issues related to the use of medicines. The year 2017 was the last year in which the supply of anti-hypertensive drugs occurred free of charge in the establishments of the PFPB. As such, the objective of the present study was to estimate the prevalence of use and to identify the sources of obtaining anti-hypertensive drugs in Brazil, according to sociodemographic variables, comparing three periods: 2011, 2014 and 2017.

METHODS

This was a cross-sectional population-based study that used data from Vigitel for the years 2011, 2014 and 2017. This telephone survey has been carried out annually, since 2006,

to monitor the frequency and distribution of risk and protective factors for NCDs in adults (age ≥ 18 years) living in all capital cities of the 26 Brazilian states and in the Federal District, in homes with at least one fixed telephone line[7-9].

In the years considered, the Vigitel system established a minimum sample size of approximately 2,000 individuals in 2011 and 2017, and 1,500 individuals in 2014, in each city. It estimated with a 95% confidence coefficient and a maximum error of three percentage points of frequency of any risk factor in the adult population (≥ 18 years). Particularly in 2017, samples of about 1,500 individuals were accepted in locations with fixed telephone coverage below 40% of households, and the absolute number of households with a telephone number below 50 thousand. Thus, maximum errors of about four percentage points were expected for specific estimates according to sex, assuming similar proportions of men and women in the sample[7-9,24].

The survey for those years was carried out through probabilistic sampling in three stages: the first consisted of the systematic random selection of 5,000 telephone numbers in each city, divided into replicates or subsamples of 200 numbers each, reproducing the same proportion of numbers per city region or telephone prefix (stratification by postal code (CEP), which were based on the electronic registration of fixed residential lines from the telephone companies that cover the cities studied). The second stage, carried out concurrently with the interviews, included the identification of residential and active lines, which were considered eligible for the system. The third stage included randomly selecting an adult resident, among all of the adults (≥ 18 years old) living in the household, to answer the interview questions[7-9].

In the present study, individuals aged 20 years or older, who reported a medical diagnosis of arterial hypertension in 2011 (n = 15,027), 2014 (n = 12,905) and 2017 (n = 18,614) were considered.

The following question was used to ask whether they took drugs to treat blood pressure: "Are you currently taking any medications to control high blood pressure?" Among those who reported the use of antihypertensive drugs, they questioned where they got them: "Where do you get the medication to control high blood pressure?", which were categorized into: SUS Health Unit (HU), PFPB and Other Sources - Private Pharmacy/Drugstores (OS).

The sociodemographic variables considered were: region of residence (Center west, Northeast, North, Southeast, South); sex (male, female); age (20–39 years, 40–59 years, 60 years or more); marital status (no spouse, spouse); race/color (white, black/ brown/ other); education (from 0 to 4 years of study, from 5 to 8 years of study, from 9 to 11 years of study, 12 or more years of study) and having a private health plan (yes, no).

The estimates were weighted for the population of each city. Final weights were assigned to each individual in order to match the estimated sociodemographic composition for the adult population with a telephone in the Vigitel sample, to the sociodemographic composition estimated for the total adult population of the same city. The post-stratification weight was calculated using the rake[7-9,25] method and the analyzes were performed using the Stata 14.0 software, considering the sample design of the research.

The prevalence of medication use was estimated among adults who reported a medical diagnosis of arterial hypertension, according to sociodemographic variables. For those who reported taking medications, distributions were verified according to the where they obtained them. Comparisons between proportions were performed using Pearson's χ^2 test (Rao-Scott), with a 5% significance level.

Individuals were informed about the research objectives at the time of being contacted by telephone and free and informed consent was replaced by verbal consent. Vigitel was approved by the National Human Research Ethics Commission (processes nº 13.081/2008 and 355.590/2013). The project in which the present study was carried out was exempt from the Unicamp Research Ethics Committee (Ofício CEP/PRP/Nº 149/2019).

RESULTS

The prevalence of medication use for the treatment of hypertension was high in the three years observed (79.6, 79 and 80%, respectively) (Table 1). As for the where individuals obtained medication, there were changes in the period, verified by the decrease in procurement through the HU (44.2%, in 2011, to 30.5%, in 2017) and by the increase in procurement

Table 1. Distribution of the adult population (≥ 20 years) and the prevalence of medication use for the treatment of arterial hypertension, according to sociodemographic variables. VIGITEL, Brazil, 2011, 2014 and 2017.

	2011			2014			2017		
	%	Prev	95%CI	%	Prev	95%CI	%	Prev	95%CI
	n = 15.027			n = 12.905			n = 18.614		
Sociodemographic characteristics									
Geographic region	p < 0.001			p = 0.006			p = 0.062		
North	6.7	63.8	60.7 – 66.8	7.4	74.6	71.0 – 77.9	7.9	73.7	70.2 – 77.0
Sul	8.2	75.9	72.9 – 78.6	8.3	78.9	75.4 – 82.0	8.1	82.1	78.1 – 82.9
Southeast	51.3	78.2	75.5 – 80.8	49.1	81.5	78.4 – 84.2	49.3	80.0	76.7 – 83.0
Northeast	23.3	73.5	71.6 – 75.3	24.2	76.6	74.3 – 78.7	24.5	80.9	79.0 – 82.4
Center West	10.5	73.5	70.1 – 76.0	11.0	77.1	73.5 – 80.2	10.2	81.7	76.7 – 85.7
Sex	p < 0.001			p < 0.001			p < 0.001		
Male	36.3	67.5	64.9 – 70.1	38.3	72.5	69.6 – 75.2	38.2	74.4	71.4 – 77.1
Female	63.7	80.5	78.9 – 82.1	61.7	83.7	81.9 – 85.4	61.8	83.9	81.8 - 85.8

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Table 1. Continuation.

	2011			2014			2017		
	%	Prev	95%CI	%	Prev	95%CI	%	Prev	95%CI
	n = 15.027			n = 12.905			n = 18.614		
Sociodemographic characteristics									
Age range (years)	p < 0.001			p < 0.001			p < 0.001		
20–39	9.6	38.6	34.6 – 42.8	10.2	46.8	41.8 – 51.9	9.6	44.6	39.1 – 50.2
40–59	44.7	76.0	73.9 – 78.0	44.4	79.2	76.8 – 81.4	41.6	80.7	78.2 – 83.0
60 or more	45.7	92.9	91.4 – 94.3	45.4	93.2	91.6 – 94.6	48.8	94.1	93 – 95.1
Marital status	p = 0.012			p = 0.616			p < 0.001		
No spouse	39.0	73.0	70.5 – 75.4	38.2	78.5	75.8 – 81.0	39.1	76.4	73.4 – 79.2
Spouse	61.0	76.8	75.0 – 78.5	61.8	79.3	77.2 – 81.2	60.9	82.6	80.6 – 84.4
Skin color/race	p = 0.001			p < 0.001			p < 0.001		
White	46.1	78.0	75.7 – 80.1	46.4	82.1	79.6 – 84.3	43.6	84.6	82.4 – 86.4
Black/ brown/ others	53.9	73.0	71.0 – 74.9	53.6	76.1	73.6 – 78.4	56.4	77.2	74.9 – 79.6
Schooling (years)	p < 0.001			p < 0.001			p < 0.001		
0 to 4	36.5	86.1	84.0 – 88.0	32.6	87.5	84.8 – 89.8	29.3	87.7	84.1 – 90.3
5 to 8	25.2	72.3	68.3 – 75.5	25.7	77.9	74.3 – 81.0	24.3	81.4	77.6 – 84.7
9 to 11	23.9	65.9	63.2 – 68.6	27.7	72.3	69.2 – 75.2	29.2	75.1	72.0 – 78.1
12 or more	14.4	74.4	70.1 – 77.6	14.0	77.9	73.9 – 81.5	17.2	75.2	71.1 - 78.9
Health insurance	p < 0.001			p = 0.007			p < 0.001		
No	52.8	79.6	77.7 – 81.4	57.1	81.5	79.2 – 83.6	54.7	76.6	74.9 – 79.3
Yes	47.2	71.7	69.6 – 73.7	42.9	77.2	74.9 – 79.3	45.3	84.6	82.5 – 86.4
Total	100.0	79.6	78.9 – 80.2	100.0	79.0	77.4 – 80.6	100.0	80.0	78.3 – 81.6

Prev: prevalence of use of antihypertensive drugs; 95%CI: 95% confidence interval; HU: Health Unit of the Public Health System (*Sistema Único de Saúde* - SUS); OS: other sources (private pharmacies/drugstores); PFPB: *Programa Farmácia Popular do Brasil*.

through the PFPB (16.1% in 2011 to 29.9% in 2017); procurement from other sources showed stability in the period (Figure 1).

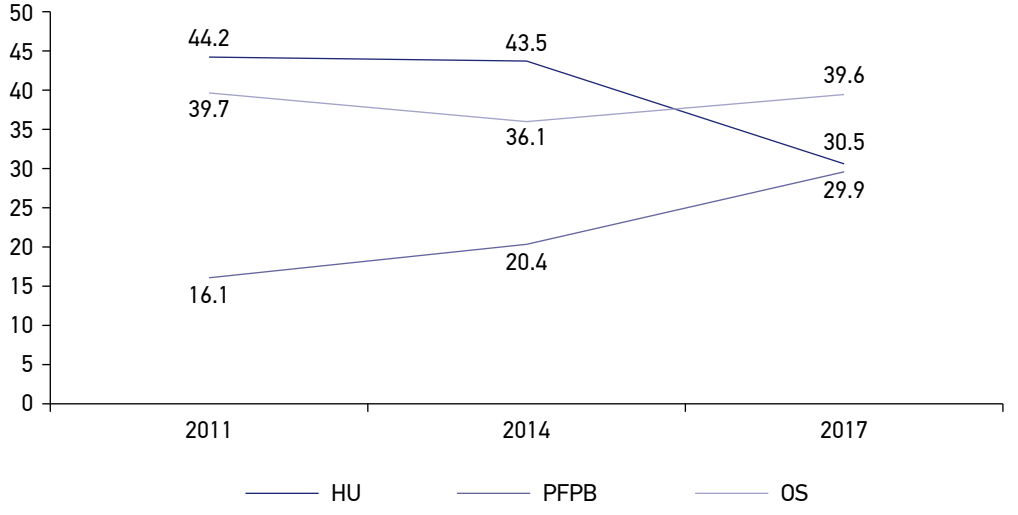
An increase in the prevalence of use was observed in the Northern Region from 2011 (63.8%) to 2014 (74.6%); in the Northeast, from 76.6% in 2014, to 80.9% in 2017, and in the Center West Region (73.5% in 2011 to 81.7% in 2017). It is important to note that when assessing the differences between the regions, in 2011, the prevalence of use in the North

Region was lower than all other regions and, in 2014, it was lower only in relation to the Southeast Region. It was equal to the others in 2017, and there were no statistically significant differences between them (p> 0.05) (Table 1).

Regarding gender, there was an increase in the use of medicines by the male population, between 2011 (67.5%) and 2017 (74.4%). Use remained stable for women. The increase in use also occurred with age, with an emphasis on the age group of 40 to 59 years (76 and 80.7% in 2011 and 2017, respectively). As for skin color/race, there was an increase in the prevalence of use in both subgroups, with a higher percentage of medication use among whites (p<0.05) (Table 1).

Individuals with less education had a higher prevalence of use than the others, around 80% in the three years observed. From 2011 (72.3%) to 2017 (81.4%), there was an increase in the use of antihypertensive drugs by individuals with 5 to 8 years of study and, in the more educated individuals, the prevalence was 65.9% in 2011, reaching 72.3% in 2014. Among those who reported having a private health plan, the prevalence of use increased between 2011 and 2017 (71.7 to 84.6%) (Table 1).

The prevalence of obtaining medication from the HU decreased in all regions in the period observed. In the North and South regions, the decrease was observed from 2014 to 2017. In the Northeast and Center West regions there was a reduction in 2014 and an increase in 2017. The Southeast Region showed an increase in this source in 2014, when compared to 2011, followed by a sharp drop in 2017. The biggest difference was observed in the Center West Region (42.5% in 2011 and 17.3% in 2017). On the other hand, there was an increase



HU: Health Unit of the Public Health System (*Sistema Único de Saúde* - SUS); OS: other sources (private pharmacies/drugstores); PFPB: *Programa Farmácia Popular do Brasil*.

Figure 1. Sources to obtain medicine for the treatment of hypertension in adults (≥20 years). VIGITEL, Brazil, 2011, 2014 and 2017.

in procurement of medicines from the PFPB in the period in all regions, being most evident in the South Region. The prevalence of obtaining medicine from other sources remained stable in the period, with the exception of the South Region, which decreased in 2014, a result that was maintained in 2017 (Table 2).

Table 2. Percentage distribution of the sources of obtaining medicine for the treatment of hypertension in adults (≥ 20 years) according to sociodemographic variables. VIGITEL, Brazil, 2011, 2014 and 2017.

	(%) 2011			(%) 2014			(%) 2017		
	HU	PFPB	OS	HU	PFPB	OS	HU	PFPB	OS
	n = 11,955			n = 10,909			n = 16,561		
Sociodemographic characteristics									
Geographic region	p < 0.001			p < 0.001			p < 0.001		
North	37.6	17.2	45.2	33.0	23.7	43.2	26.7	33.7	42.6
Sul	45.4	12.3	42.3	40.9	24.3	34.7	29.6	35.6	34.8
Southeast	47.3	17.9	34.8	52.2	18.5	29.3	36.6	27.5	35.9
Northeast	39.6	15.0	45.4	34.1	21.6	44.2	26.1	30.8	43.0
Center West	42.5	12.2	45.3	34.0	21.0	45.0	17.3	32.0	50.7
Sex	p = 0.109			p = 0.124			p = 0.009		
Male	41.7	16.4	41.9	42.2	19.2	38.6	28.2	28.9	42.9
Female	45.6	16.0	38.4	44.3	21.1	34.6	31.9	30.6	37.5
Age range (years)	p = 0.560			p = 0.959			p = 0.114		
20–39	46.0	16.5	37.5	44.0	21.3	34.7	23.3	33.2	43.5
40–59	45.5	16.0	38.5	43.0	20.2	36.9	30.1	30.2	39.7
60 or more	42.6	16.1	41.3	43.9	20.4	35.7	32.2	29.1	38.7
Marital status	p = 0.591			p = 0.602			p = 154		
No spouse	44.6	16.7	38.7	44.9	19.9	35.2	32.3	29.8	37.9
Spouse	44.1	15.7	40.2	43.0	20.8	36.3	29.4	29.8	40.7
Skin color/race	p < 0.001			p < 0.001			p < 0.001		
White	38.2	18.3	43.6	38.4	19.7	41.9	27.7	28.5	43.8
Black/brown/others	49.3	14.1	36.6	47.3	20.9	31.8	32.7	31.1	36.1

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Table 2. Continuation.

	(%) 2011			(%) 2014			(%) 2017		
	HU	PFPB	OS	HU	PFPB	OS	HU	PFPB	OS
	n = 11,955			n = 10,909			n = 16,561		
Sociodemographic characteristics									
Schooling (years)	p < 0.001			p < 0.001			p < 0.001		
0 to 4	58.3	13.5	28.2	54.0	18.5	27.6	41.3	29.8	28.4
5 to 8	50.1	15.7	34.2	51.3	19.5	29.1	38.4	30.4	31.1
9 to 11	34.8	18.9	46.3	38.5	23.7	37.8	25.7	31.4	42.9
12 or more	13.6	18.9	67.5	14.6	20.0	65.4	9.2	26.8	64.0
Health insurance	p < 0.001			p < 0.001			p < 0.001		
No	65.3	9.9	24.8	60.5	17.2	22.3	44.4	28.4	27.1
Yes	20.5	23.1	56.4	20.5	24.7	54.8	13.7	31.9	54.4
Total	44.2	16.1	39.7	43.5	20.4	36.1	30.5	29.9	39.6

HU: Health Unit of the Public Health System (*Sistema Único de Saúde* - SUS); OS: other sources (private pharmacies/drugstores); PFPB: *Programa Farmácia Popular do Brasil*.

A similar behavior was observed in the other variables studied in all strata, with a decrease in the prevalence of procurement from the HU, and an increase in procurement from the PFPB, without alteration to other sources, except among more educated people. It is worth noting that these changes were observed between 2014 and 2017. In the period from 2011 to 2014, the only statistically significant variation occurred for individuals who did not have a private health plan, which may indicate a migration from the HU to PFPB during the period (Table 2).

DISCUSSION

The results of this study showed a high prevalence of medication use for the treatment of arterial hypertension in the three years considered. However, they were less than the results found in the PNAUM in 2014[26]. According to data from the 2013 PNS, the prevalence of arterial hypertension and the use of antihypertensive drugs in the Brazilian adult population was 21.4 and 81.4%, respectively. Lower frequencies of drug treatment or non-use among patients with hypertension and diabetes, may be related to barriers to access and adherence to treatment, in addition to the possibility that some segments of patients reduced their use of drugs and adopting other forms of controlling the diseases, such as changes in habits and lifestyles[27].

With regard to the use of antihypertensive drugs in the various regions of the country, observing the years 2014 and 2017, the increase in prevalence in the North and Northeast regions stands out, reflecting possible improvements in regional inequalities. These two macro-regions, in particular, are less developed socially and economically, however these findings may suggest advances in the organization of the networks that make up the SUS, favoring access to services in basic Health Units (HU), medicines, and diagnoses[28-31].

The percentage of medication use was lower among men, findings that corroborate other national surveys[6,26], but there was an increase in 2017 when compared to 2011. Women tend to visit the health care system more frequently. Additionally, they have more accurate perceptions of their symptoms and their own health[32]. The prevalence of medication use increased with advancing age, results similar to those observed in previous studies[6,26,33], since younger people are prescribed drugs less frequently. In addition, they adhere less to treatment than older individuals[26].

As for skin color/race, the use of antihypertensive drugs was higher among whites in the study period. Even with an increase in the prevalence of use in both categories, when comparing 2011 and 2017, the differences remain. This may indicate that the white population has better access when compared to blacks, browns/others. Among the latter group, greater access was observed in the SUS health unit pharmacies, results that are consistent with previous studies that show the attendance, in the HU, of groups with historically less favored socioeconomic insertion in the country. This suggests that equity is being promoted[27].

The prevalence of antihypertensive drug use has increased over the years among users who reported having a private health plan, while use by those who did not remained stable. In 2011, use was greater among those who did not have a plan, a situation that was reversed in 2017. Individuals who adhere to supplementary health, in general, tend to be more educated and have a higher income, which can contribute to them being more careful in accepting the most rigorous treatment[34].

Considering the sources for obtaining medications, the migration from HU to the PFPB is evident. The first year observed (2011) coincides with the start of free anti-hypertensive drugs through the "Health has no price" *"Saúde não tem preço"* campaign. Until then, the PFPB was still the least prevalent source of medications among the three evaluated, with percentages much lower than the others. In 2014, it was already growing, but it still remained significantly below the other sources.

According to PNAUM data, in 2014, 16% of hypertensive patients using drugs, obtained them through the PFPB.[26] Vigitel's data for the same year, presented in the present study, are slightly higher, which may be explained by the fact that the telephone survey is carried out only in the capital cities, where the presence of pharmacy units affiliated with "Aqui tem Farmácia Popular" tends to be greater when compared to other municipalities. In 2017, the percentage of obtaining medicines via PFPB was equal to obtaining them via HU. This reinforces the importance of the program as one of the main access routes to medicines for the treatment of hypertension in Brazil.

Despite this wide coverage, discussions and reflections regarding disconnect with the public health and pharmaceutical services system, in addition to the monetary amount invested in the program in the face of inconsistencies with its restrictive list of medications that do no align with current guidelines and protocols, are frequent[19]. Specifically, the ATFP received numerous criticisms due to the significant increase in the amount spent by the Ministry of Health, in contrast to the volume of resources transferred to the municipalities for the purchase of the medicines for the Basic Component of Pharmaceutical Assistance (*Componente Básico da Assistência Farmacêutica* - CBAF). In 2006, the ratio between the volume of resources invested in the ATFP compared to the CBAF was 0.06, increasing to 2.28 in 2014. In the same period, spending on ATFP evolved, on average, 88% compared to only 2% in on-lending of the CBAF[35].

Regional differences were observed, with emphasis on the North and Northeast regions, which had lower prevalence of obtaining medicine from the HU in 2011, compared to the other regions. These prevalences were even lower in 2017. The biggest drop, however, was in the Center West. However, when analyzing the PFPB, in 2017, the regional differences were no longer so explicit, which can be justified by the wide spread of establishments linked to the "Aqui tem Farmácia Popular". It was initially thought of as a complement to access, and then it expanded greatly, accounting for more than 30 thousand establishments with agreements in 2014[35].

It is worth mentioning that approximately 40% of adults living in Brazilian capital cities and the Federal District in the three years considered, reported obtaining their medications from other sources (private pharmacies/drugstores). This reveals that more than a third of Brazilian adults do not obtain their medication free of charge, despite the increase in investments by the federal government to expand access to medicines for the treatment of chronic diseases, such as hypertension, in the period[23]. In Brazil, between 2002 and 2006, public spending on medicines increased 115%, while the gross domestic product (GDP) grew 14.4% and the Ministry of Health budget grew 9.6%.[35] Even so, in 2017, the last observed period, obtaining medicines from other sources was the most prevalent.

The decrease in access via the HU may suggest a low supply of drugs in the scope of primary care. Although antihypertensive drugs can be purchased free of charge via PFPB, this program guarantees free access only to medicines for hypertension, diabetes and asthma, while the basic component of the National List of Essential Medicines (*Relação Nacional de Medicamentos Essenciais* - RENAME) currently has 371 items and aims to cover the needs of priority medicines of the Brazilian population[36], according to well-defined clinical guidelines and protocols.

Among the limitations of the present study, the restriction of the sample to individuals residing in the capital cities of Brazilian states and in the Federal District, and to those who have landlines must be considered. It limits their representativeness, which, however, is minimized by the use of weighting factors of data through post-stratification. In addition, fixed telephone coverage in the country has been constantly monitored by the Vigitel management team[37]. Also, the use of self-reported morbidity to the detriment of clinical criteria

for diagnosing the disease, may underestimate the prevalence of the disease. Thus, the data presented refer only to cases already diagnosed by a physician, and the self-report is an accurate measure to assess the prevalence of a known diagnosis of the disease[38]. In addition, possible information bias may arise regarding the indication of drug treatment for hypertension and the correct identification of the source of how individuals obtain medications.

The prevalence of use of antihypertensive drugs remained stable and the sources for obtaining underwent an inversion over the analyzed period, migrating mostly from the HU to PFPB units, with no statistically significant changes in the prevalence of obtaining medications from other sources. This change highlights the capillarity and the geographical ease of access via PFPB, reaffirming it as one of the main sources of medicines for the treatment of hypertension in Brazil. However, the decrease in access through the Health Units may signal a weakening of the supply of medication in primary care, which can be confirmed by monitoring this information for subsequent years.

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