

## Factors Associated with Access to Medications Used by Hypertensive Patients Treated in Primary Health Care

### Fatores Associados ao Acesso a Medicamentos Utilizados Por Hipertensos Atendidos na Atenção Primária à Saúde

Indhyana Lopes Oliveira<sup>\*a</sup>; Ingrid Novaes Leão<sup>b</sup>; Brígida Dias Fernandes<sup>c</sup>; Bruno Goncalves de Oliveira<sup>d</sup>; Gisele da Silveira Lemos<sup>a</sup>; Paulo Henrique Ribeiro Fernandes Almeida<sup>c</sup>; Claudio Henrique Meira Mascarenhas<sup>d</sup>

<sup>a</sup>State University of Southwest Bahia, Department of Science and Technologies. BA, Brazil.

<sup>b</sup>General Hospital Prado Valadares and Municipal Health Department of Jequié, BA, Brazil.

<sup>c</sup>Federal University of Minas Gerais, Graduate Program in Medicines and Pharmaceutical Services, Department of Social Pharmacy, Faculty of Pharmacy. MG, Brazil.

<sup>d</sup>State University of Southwest Bahia, Nursing and Health Graduate Program. BA, Brazil.

\*E-mail: [indhy.lobes@hotmail.com](mailto:indhy.lobes@hotmail.com).

---

#### Abstract

The provision of access to medicines and the promotion of their rational use has become a challenge for universalized health systems, especially in the care of individuals with chronic diseases, such as hypertension. Thus, the objective was to analyze the factors associated with the availability of drugs used by hypertensive individuals. A cross-sectional study was conducted using a structured questionnaire whose information was collected in the homes of hypertensive patients enrolled in Primary Health Care. The data collected referred to the use and form of medication acquisition, sociodemographic, clinical and anthropometric data. Of the 235 hypertensive individuals participating, the majority belonged to the female sex, were over 60 years old and had more than one comorbidity. The mean drug was 3.69 (SD ± 2.01) per user. Most users obtained the drugs through the pharmacy linked to the Family Health Strategy unit (ESF) (56.2%). The prevalence of access to medicines through public sources was 83%. In the case of the non-availability of drugs in the ESF pharmacy, 49.8% of the users purchased them in private pharmacy. The sources of obtaining medication were associated with blood pressure, obesity and income ( $p < 0.05$ ), and individuals with poorer health conditions and lower income, obtained their drugs more often in pharmacy linked to the ESF. The results demonstrate the important role of the Unified Health System (Sistema Único de Saúde) in providing access to medicines, indicating the need for improvement in public pharmaceutical care in order to ensure the rational use of these products.

**Keywords:** Hypertension. Health Services Accessibility. Pharmacoepidemiology.

#### Resumo

A provisão de acesso a medicamentos e a promoção do seu uso racional têm se tornado um desafio para os sistemas de saúde universalizados, principalmente no cuidado de indivíduos que apresentam doenças crônicas, como a hipertensão. Assim, objetivou-se analisar os fatores associados a disponibilidade de medicamentos utilizados por indivíduos hipertensos. Foi realizado um estudo transversal com a utilização de um questionário estruturado cujas informações foram coletadas nos domicílios dos pacientes hipertensos cadastrados na Atenção Primária à Saúde. Os dados coletados referiam-se a uso e forma de aquisição de medicamentos, dados sociodemográficos, clínicos e antropométricos. Dos 235 indivíduos hipertensos participantes, a maioria pertencia ao sexo feminino, tinha mais de 60 anos e apresentava mais de uma comorbidade. A média de medicamento foi 3,69 (DP ± 2,01) por usuário. A maioria dos participantes obtinha os medicamentos através da farmácia vinculada a unidade da Estratégia Saúde da Família (ESF) (56,2%). A prevalência de acesso a medicamentos por meio de fontes públicas foi de 83%. No caso da indisponibilidade de medicamentos na farmácia da ESF, 49,8% dos usuários os adquiriam em farmácia privada. As fontes de obtenção de medicamento estiveram associadas a pressão arterial, obesidade e renda ( $p < 0,05$ ), sendo que indivíduos com piores condições de saúde e com menor renda, obtiveram seus medicamentos mais frequentemente na farmácia vinculada à ESF. Os resultados demonstram o papel importante do Sistema Único de Saúde na provisão de acesso à medicamentos, indicando a necessidade de melhoria na assistência farmacêutica pública, a fim de garantir o uso racional desses produtos.

**Palavras-chave:** Hipertensão. Acesso aos Serviços de Saúde. Farmacoepidemiologia.

---

#### 1 Introduction

Systemic arterial hypertension (SAH) is characterized by its high and sustained blood pressure (BP) levels associated with several physiological changes, being considered one of the main public health problems, with a growing prevalence in the population, especially in individuals in the fourth decade of life, and risks of complications related to negative clinical outcomes<sup>1,2</sup>.

The control of SAH requires the introduction of drug therapy to meet the needs of the patient, as well as the adoption

of non-pharmacological measures that promote healthy habits and lifestyles, contributing to the reduction of cardiovascular events and improvement of the quality of life (QoL) of individuals<sup>1</sup>. Such interventions require the health systems and services to guarantee access to the technologies necessary for the continuous follow-up of patients, together with articulated actions of prevention and early diagnosis<sup>3</sup>.

In this context, the Unified Health System (SUS) has advanced in the adoption of policies and in the implementation of programs aimed at promoting access to medicines and basic health services, such as the development of strategies for the qualification of Pharmaceutical assistance (FY)<sup>4</sup> and the reorganization of primary care through the Family Health Strategy (FHS)<sup>3,5</sup>.

In addition, in order to guarantee access to essential medicines, Brazil adopts a mixed model of AF, in which these products are provided free of charge by public pharmacies linked to the services of basic health care and, in addition, by means of a federal government payment system, in a network of own and public pharmacies with the “popular Pharmacy of Brazil” program and later in private pharmacies accredited in the program “Here has a popular drugstore” (an agreed network), with medications for the treatment of hypertension, diabetes and asthma, they are fully subsidized by the government in any of the programs<sup>6</sup>. State governments have also modeled their own programs in partnerships with municipalities to extend access to essential medicines<sup>7</sup>, such as the Program Medicines at Home (MedCasa), implemented by the Bahia State Department of Health (SESAB) and which provided medicines for hypertension, diabetes and family planning, at the residence of patients who met the inclusion criteria of the program<sup>8</sup>.

In view of the different strategies developed to provide access and, with the strong growth of federal government investment in the popular drugstore program, especially in the agreed network<sup>6,9</sup>, it is necessary to evaluate the impact of such interventions on access to medicines to guide the improvement of these interventions, as well as to subsidize decision-making by the managers.

However, the access assessment is a challenge, because it is a complex concept, in which there is no harmonization between researchers and policymakers<sup>4,10,11</sup>. In this context, Penchansky and Thomas<sup>10</sup> defined access as a measure of “adjustment” between the characteristics of health services and those of the clients, and which consists of five dimensions: availability, accessibility, accommodation, purchasing capacity and acceptability<sup>4</sup>, being the availability, the relationship between the provision of services and resources and the needs of clients<sup>10</sup>.

Thus, it is necessary to investigate the use and access to medications by hypertensive patients, addressing different access dimensions, in order to support the discussion about possible inequities in the system, the related factors and guide improvements in health care. Thus, the objective was to analyze the factors associated with the availability of drugs used by hypertensive individuals.

## 2 Material and Methods

This is a cross-sectional, descriptive-analytical study, part of a research project entitled “Clinical-pharmacological study applied to the quality of life of patients with arterial hypertension”, carried out with hypertensive patients registered in the National Program of hypertension and Diabetes mellitus (HIPERDIA) of the municipality of Jequié/BA, Between February 2014 and February 2015 on 27 ESF units<sup>12</sup>.

The sampling plan considered the 11,471 hypertensive users registered in the city’s Basic Care Information System (SIAB) in February 2014<sup>13</sup>, mean QOL of hypertensive patients, 69.70<sup>14</sup>, 90% confidence interval (CI), estimated accuracy of 5% and design effect of 1, a probabilistic sample of 220 users was found. For the final sample, 10% were added to anticipate possible losses, totaling 242 users<sup>12</sup>.

For the selection of users, a simple random sample (AAS) was performed, assigning a numeric code to each user registered in HIPERDIA. The codes were assigned using the *IBM Statistical Package for the Social Sciences (SPSS)* software, version 21.0 (IBM Corp, Armonk, United States of America). Inclusion criteria were users aged 18 years or over, previously diagnosed with SAH and using medications. Users unable to respond for cognitive and misleading deficit to HIPERDIA for more than six months were excluded<sup>12</sup>.

Data collection was performed in the homes of the users using a structured questionnaire. There was training for the interviewers regarding the BP collection and measurement instrument. The questionnaire was previously tested in a non-inclusive pilot test with ten patients bearing SAH from a Basic Health Unit (UBS)<sup>12</sup>.

Data on continuous use medications were collected using the self-report and the last medical prescription presented by the interviewee, and the same were categorized according to the ATC system (*Anatomical Therapeutical Chemical*)<sup>15</sup>. In order to identify the availability of the medications, users were asked about the places to obtain these products in a general way, having as answer options: An ESF-linked drugstore; a private drugstore; a popular drugstore, its own or its own-owned network; a MedCasa-SESAB program. It was also asked about the places of obtaining when there was no medication in the pharmacies linked to the ESF, having as answer options: Private drugstore; popular drugstore own or agreed network; no longer taking; did not identify lack/lack of supply.

Sociodemographic data (gender, age, color, marital status, education and income), clinical data (BP and chronic comorbidities) and anthropometric data (weight, height and abdominal circumference) were also collected. BP was measured in triplicate, with a five-minute interval between each measurement, and mean SBP and DBP were obtained with the results of the last two measurements, according to the recommendation of the Brazilian Society of Cardiology<sup>1</sup>

. Based on the values of weight (in kg) and height (in centimeters) values collected, the body mass Index (BMI) was calculated, and users were classified as: Eutrophic (18.5 to 24.9 kg/m<sup>2</sup>), pre-obese (25 to 29.9 kg/m<sup>2</sup>) and obese (>30kg/m<sup>2</sup>)<sup>16</sup>. The measurement of abdominal circumference (WC) was obtained with a non-extensible tape measure, considering the midpoint between the costal margin and the iliac crest. In addition, CA values were classified according to their metabolic complications according to abdominal circumference (CMCA) in: <80cm, 80 to 88cm e ≥88cm, for women and, <94cm, 94 to 102cm and ≥102cm, for men, were classified in normal, with increased risk and with risk increased substantially for metabolic complications, respectively<sup>16</sup>.

The data were grouped into spreadsheets in the Excel 2010<sup>®</sup> software, and were later transported to the SPSS software, version 21.0, for data analysis. Sociodemographic, clinical, lifestyle variables and drugs use were described as absolute and relative frequencies. The quantitative variable of medications was described with mean, standard deviation (SD) and 95%CI. The Kolmogorov-Smirnov test was used to verify the normality parameters. Student's T and ANOVA with Bonferroni correction were performed later when *post-hoc analysis* and Pearson's chi-square test were required. A significance level  $p < 0.05$  was considered.

The research was approved by the Research Ethics Committee (CEP) of the State University of Southwest Bahia (CAAE n° 16729413.0.0000.0055 and approval protocol

319.835/2013).

### 3 Results and Discussion

The present study obtained a total sample of 235 hypertensive individuals, most of whom belonged to the female sex (74.9%; n=176), were over 60 years old (65.5%; n=154), self-declared black (74%; n=174) and received between one and two minimum wages (61.3%; n=144).

Regarding the clinical characteristics, most users had more than one non-transmissible chronic comorbidity (64.8%; n=153), BP ≥121/81mmHg (57.5%; n=135), substantially increased risk for metabolic complications (74%; n=173) and was above weight (63.8%; n=150). Mean SBP was 139 (SD±19.7) mmHg and mean DBP was 85 (SD±12.4) mmHg. The mean chronic comorbidity per patient was 1.90 (SD±1.95), with type 2 diabetes (39%; n=82), dyslipidemia (14%; n=33), arthrosis (12%; n=28) and cardiovascular disease (5%; n=11), the most frequent ones.

There were 868 prescription drugs for continuous use, with a total average of 3.69 (SD± 2.01) per user. The use of medications was higher in women (3.74; SD± 2.06), users aged between 51 and 60 years (3.93; SD ± 2.27), with lower education level (3.58; SD± 1.91), non-black users (4.10; SD ± 2.08) and who had income from two and three minimum wages (3.85; SD ± 2.31) (Chart 1). The mean number of medications per user also increased with increased BP, BMI, risk of CMCA and presence of comorbidities, showing a statistically significant difference with the latter.

**Table 1** - average quantity of continuous use medications, according to sociodemographic and clinical data of the sample. Jequié, Bahia, Brazil, 2015 (N = 235)

Variables	Sample		Use of Medicines		IC95%	Value of p
	N	%	Mean	SD±		
Sex						
Female	176	74.9	3.74	2.064	3.44 – 4.05	0.950
Male	59	25.1	3.54	1.860	3.06 – 4.03	
Age Range						
31 – 50	21	9.0	2.86	1.389	2.23 – 3.49	0.113
51 – 60	60	25.5	3.93	2.269	3.35 – 4.52	
> 60	154	65.5	3.71	1.959	3.40 – 4.03	
Marital status						
With companion	137	58.3	3.81	2.070	3.49 – 4.19	0.889
No companion	98	41.7	3.49	1.922	3.10 – 3.88	
Schooling						
Elementary School	192	81.7	3.58	1.913	3.31 – 3.86	0.214
Average	43	18.3	4.15	2.347	3.46 – 4.85	
Skin color						
Black	174	74	3.55	1.972	3.26 – 3.85	0.256
Not black	61	26	4.10	2.087	3.56 – 4.63	

Monthly Family income (minimum wages)						
<1 salary	53	22.55	3.55	2.108	2.97 – 4.13	0.257
Between 1 – 2 wages	144	61.28	3.63	1.939	3.31 – 3.95	
Between 2 – 3 wages	26	11.06	3.85	2.310	2.91 – 4.78	
<4 salaries	12	5.11	4.75	1.658	3.70 – 5.80	
Blood pressure						
≤120/80mmHg	100	42.5	3.71	2.071	3.29 – 4.12	0.691
≥121/81mmHg	135	57.5	3.68	1.977	3.35 – 4.02	
BMI						
Eutrophic	85	36.2	3.38	1.932	2.88 – 3.88	0.334
Pre-obese	95	40.4	3.73	1.972	3.35 – 4.10	
Obese (Grade 1, 2 and 3)	55	23.4	3.92	2.146	3.39 – 4.45	
Risk of CMCA						
Normal	24	9.6	3.17	2.371	2.17 – 4.17	0.256
Increased	38	16.4	3.45	1.841	2.84 – 4.05	
Substantially increased	173	74	3.82	1.990	3.52 – 4.12	
Comorbidities						
Only HAS	82	35.2	2.76	1.536	2.42 – 3.09	0.000*
Between 1 and 2 comorbidities	136	58	4.02	1.949	3.69 – 4.35	
3 or more comorbidities	17	6.8	5.59	2.451	4.33 – 6.85	

CMCA: Metabolic complications according to abdominal circumference. BMI: Body mass index. \* statistically significant values  $p < 0.05$ .

Source: Research data.

The most frequent medications were in the cardiovascular system (63%;  $n=479$ ) and in the Food Tract and metabolism (22%;  $n=190$ ). When considering the categorization of TCA subgroup, diuretics were the most prevalent (21%;  $n=179$ ), and hydrochlorothiazide (HCTZ) was the most widely used drug in this subgroup (18%;  $n=150$ ); followed by agents acting in the renin-angiotensin system (20%;  $n=175$ ), with losartan (LOS) being the most commonly used (14%;  $n=119$ ) (Chart 2).

**Table 2** - Therapeutic subgroups and their most prevalent representatives, according to *the anatomic therapeutic Chemical (ATC)* system of the drugs used by the sample. Jequié, Bahia, Brazil, 2015 ( $N = 235$ )

ATC system - second level	N	%
<b>Diuretics (C03)</b>	<b>179</b>	<b>21</b>
Hydrochlorothiazide	150	18
Furosemide	17	2
Others	12	1
<b>Agents acting in the renin-angiotensin system (C09)</b>	<b>175</b>	<b>20</b>
Losartan	119	14
Enalapril	30	3
Captopril	19	2
Others	7	1
<b>Medicines used in Diabetes (A10)</b>	<b>133</b>	<b>15</b>
Glibenclamide	61	7
Metformin.	54	6
Others	18	2
<b>Beta-blocker agents (C07)</b>	<b>63</b>	<b>7</b>

Atenolol	24	3
Propranolol	24	3
Others	15	1
<b>Calcium channel blocking agents (C08)</b>	<b>62</b>	<b>7</b>
Anlodipine	53	6
Nifedipine	9	1
<b>Antithrombotic agents (B01)</b>	<b>53</b>	<b>6</b>
AAS	48	5.5
Others	5	0.5
<b>Lipid modifying agents (C10)</b>	<b>46</b>	<b>5</b>
Simvastatin	43	4.7
Others	3	0.3
<b>Medicines for acid-related disorders (A02)</b>	<b>40</b>	<b>5</b>
Omeprazole	34	4
Pantoprazole	6	1
<b>Others*</b>	<b>117</b>	<b>14</b>
<b>Total</b>	<b>868</b>	<b>100</b>

\*It includes all subgroups with prevalence  $< 4\%$ .

Source: Research data.

Regarding the availability of medications, most users obtained the medications through the drugstore linked to the unit of ESF (56.2%;  $n=132$ ). Considering all public sources of medicine, the frequency of access reached 83% ( $n=195$ ). In the case of the unavailability of medications in the ESF drugstore, 49.8% ( $n=117$ ) of users purchased their medications in a private drugstore, and only 4.2% ( $n=10$ ) used the Program Here has popular Drugstore (Chart 3).

**Table 3** - Availability of the medicinal products used by the sample for primary and secondary sources of production. Jequié, Bahia, Brazil, 2015 (N = 235)

Variables	N	%
Primary sources of obtaining medications		
Drugstore linked to the ESF	132	56.2
Popular Drugstore of Brazil – own Network	24	10.2
Private Drugstore	40	17
Program here has popular Drugstore	19	8.1
MedCasa	20	8.5
Total	235	100
Secondary sources of obtaining medicines		

Private Drugstore	117	49.8
Popular Drugstore of Brazil – own Network	52	22.1
Program here has popular Drugstore	10	4.2
Does not take/does not know	3	1.3
They did not report the absence of medicine in the ESF	53	22.6
Total	235	100

ESF: Family Health Strategy MedCasa Program medicine in Casa da Bahia.

Source: Research data.

The prevalence of FHS-related drugstores was higher in individuals with average monthly income between one to two minimum wages and among those with BP≥121/81mmHg, with a statistically significant association (p<0.05) (Chart4).

**Table 4.** Availability of the drugs used by the sample in the primary sources of production, according to sociodemographic and clinical variables. Jequié, Bahia, Brazil, 2015 (N = 235)

Variables	N availability (%)					Value of p
	ESF	FPB	FP	PATFP	MedCasa	
<b>Sex</b>						
Female	104 (44.3%).	15 (6.4%).	33 (14%).	11 (4.7%).	13 (5.5%).	0.084
Male	28 (11.9%).	9 (3.8%).	7 (3.0%).	8 (3.4%).	7 (3.0%).	
<b>Age</b>						
31 – 50	10 (4.2%).	4 (1.7%).	5 (2.1%).	1 (0.4%).	1 (0.4%).	0.542
51 – 60	34 (14.5%).	4 (1.7%).	10 (4.2%).	8 (3.4%).	4 (1.7%).	
> 60	88 (37.6%).	16 (6.8%).	25 (10.7%).	10 (4.2%).	15 (6.4%).	
<b>Marital status</b>						
With companion	69 (29.4%).	17 (7.2%).	23 (9.8%).	14 (6.0%).	14 (6.0%).	0.164
No companion	63 (26.8%).	7 (3.0%).	17 (7.2%).	5 (2.1%).	6 (2.5%).	
<b>Schooling</b>						
Elementary School	108 (46.0%).	19 (8.0%).	32 (13.6%).	15 (6.4%).	15 (6.4%).	0.964
Average	24 (10.3%).	5 (2.1%).	8 (3.4%).	4 (1.7%).	5 (2.1%).	
<b>Skin color</b>						
Black	101 (43.0%).	14 (6.0%).	29 (12.4%).	17 (7.2%).	13 (5.5%).	0.149
Not black	31(13.2%)	10 (4.2%).	11(4.7%)	2 (0.8%).	7(3.0%)	
<b>Income</b>						
<1 salary	39 (16.7%).	2 (0.8%).	9 (3.8%).	1 (0.4%).	2 (0.8%).	0.001 <sup>a</sup>
Between 1 – 2 wages	83 (35.4%).	17 (7.2%).	22 (9.4%).	11(4.7%)	11 (4.7%).	
Between 2 – 3 wages	7 (3.0%).	3 (1.3%).	7 (3.0%).	3(1.3%)	6 (2.5%).	
<3 salaries	3 (1.3%).	2 (0.8%).	2 (0.8%).	4 (1.7%).	1 (0.4%).	

<b>Blood pressure</b>						
≤120/80mmHg	38 (16.2%).	11 (4.7%).	24 (10.3%).	12 (5.0%).	14 (6.0%).	0.000 <sup>b</sup>
≥121/81mmHg	94 (40%).	13 (5.5%).	16 (6.8%).	7 (3.0%).	6 (2.5%).	
<b>BMI</b>						
Eutrophic	42 (17.9%).	4 (1.7%).	6 (2.5%).	1 (0.4%).	7 (3.0%).	0.024 <sup>c</sup>
Pre-obese	61 (26.0%).	14 (6.0%).	18 (7.7%).	8 (3.4%).	9 (3.8%).	
Obese (Grade 1, 2, 3)	29 (12.4%).	6 (2.5%).	16 (6.8%).	10 (4.2%).	4 (1.7%).	
<b>Risk of CMCA</b>						
Normal	18 (7.7%).	0	1 (0.4%).	2 (0.8%).	3 (1.3%).	0.252
Increased	17 (7.2%).	5 (2.1%).	7 (3.0%).	5 (2.1%).	4 (1.7%).	
Substantially increased	97 (41.4%).	19 (8.1%).	32 (13.7%).	12 (5.0%).	13 (5.5%).	
<b>Comorbidities</b>						
Only HAS	43 (18.4%).	6 (2.5%).	20 (8.6%).	7 (3.0%).	6 (2.5%).	0.173
Between 1 – 2	80 (34.1%).	18 (7.7%).	15 (6.4%).	11 (4.7%).	12 (5.0%).	
3 or more	9 (3.8%).	0	5 (2.1%).	1 (0.4%).	2 (0.8%).	

(a) , (b) and (c) values of  $p < 0.05$ . ESF: Family Health Strategy FP: Private Drugstore FPB: Popular drugstore in Brazil. PATFP: Program here has a popular drugstore. Medcasa: Program medicine in Casa da Bahia. BMI: Body mass index. CMCA: Metabolic complications according to abdominal circumference.

**Source:** Research data.

The results of the present study indicate the role of integral care to patients with hypertension, demonstrating the need for interventions that improve health conditions and promote continuous access to the necessary medications.

The mean number of medications used by hypertensive individuals in this study was lower than that found in elderly hypertensive individuals<sup>17,18</sup>, but close to that found in a study with hypertensive patients treated by a public network of drugstores in Minas Gerais (3,8)<sup>19</sup>. Drug use also increased when the user presented worse clinical conditions and was statistically associated with the addition of chronic non-communicable diseases.

The advance of age, as well as the presence of comorbidities, increases the use of medications<sup>17,19,20</sup>. However, such aspects also increase the chances of drug interactions<sup>21-23</sup>, making appropriate drug therapy management necessary to ensure optimal health outcomes<sup>24</sup>.

The most prevalent medications were active in the cardiovascular system and in the diet and metabolism, as expected due to the sample being restricted to patients in the HIPERDIA program. The most commonly used antihypertensive drugs were also the same as those found in other studies with hypertensive population<sup>17,19,25,26</sup> and presented scientific evidence of efficacy and safety in SAH treatment<sup>1,27</sup>. However, the hypertensive patients presented worrying clinical conditions, such as uncontrolled

BP, overweight, increased abdominal circumference and other comorbidities, risk factors for cardiovascular complications<sup>1</sup> and other chronic-degenerative diseases, emphasizing the importance of verifying the correct follow-up of pharmacotherapy and promoting interventions aimed at changes in habits and lifestyles<sup>1,19,25</sup>.

In addition to the patients' attachment for the follow-up at the FHS, the Plan for the reorganization of the attention to arterial hypertension and Diabetes mellitus provides for the continuous availability of medications for these conditions in the drugstores associated with the FHS<sup>28</sup>. However, little more than half of the users acquire their medications in the FHS-linked drugstore (56.2%), a lower frequency than that found in a study conducted with hypertensive patients from the municipalities of Pernambuco, in which 69% acquired anti-hypertensive drugs in the drugstore linked to ESF<sup>26</sup> and close to the one found in the National Research on Access, use and Promotion of the rational use of medicines in Brazil (PNAUM) (56%)<sup>25</sup>.

In this study, although most of the drugs in use by the sample operate in the cardiovascular system, it was not asked about access only to antihypertensive drugs, but to all those in continuous use. Thus, when comparing with studies on the evaluation of access to global pharmacotherapy, the frequency remains below the one found by PNAUM, in which 67% reported always or repeatedly obtaining medications in

the primary care dispensing units of SUS<sup>29</sup> and, from what was reported by hypertensive and diabetic patients in Minas Gerais (74.3%)<sup>19</sup>.

The results of this study also revealed that BP, BMI and income were significantly associated with drug sources, and individuals with poorer health conditions and lower income obtained their medications more frequently in the FHS-linked drugstore, as also found in another study<sup>30</sup>. These findings show the role of SUS in facilitating the drug treatment of hypertensive individuals, making improvements in the management and structuring of AF necessary in primary care, in order to guarantee the availability of medications in an uninterrupted manner and in full follow-up of these individuals<sup>29,31</sup>.

When considering all public sources of medication, the frequency of access rises to 83%, demonstrating the role of federal/state management programs to increase access to essential medicines, such as the popular Drugstore Program (own and/or contracted Network) and the Drug Program in Casa da Bahia.

However, the results also show that when there was no medication in the FHS-linked drugstores, almost half of the individuals reported to obtain it in the private drugstore instead of using the popular Drugstore program (own network and/or contracted one). Considering that these are individuals who mostly had a higher socioeconomic vulnerability, buying medications may be a barrier to treatment compliance.

In this context, the coexistence of different AF models to ensure access to medicines has been the subject of debate about their advantages and disadvantages as a public health policy. In general, public drugstores have lower availability of hypertension and diabetes drugs than the popular Drugstore Program (own and/or contracted network) and private drugstores, which contributes to increased use of the program<sup>32</sup>. However, even with the increase in the dispensing of medicines by the program, the supply by public drugstores remained the most important source of medication, mainly for the treatment of hypertension and diabetes<sup>6</sup>. In addition, despite the increase in the geographic coverage of the popular drugstore program, accredited pharmacies are distributed unevenly, with less coverage in the North and Northeast regions.

In 2017, the arm of the popular drugstore program's own network was instinct, reviving the debate on the efficient application of public resources to provide access to medicines. While municipal managers suggest difficulties in the management of their own network and high costs for the maintenance of pharmacies<sup>34</sup>, some studies point out that the supply of medicines by public pharmacies seems to be more economically favorable than by the accreditation of private drugstores, considering the potential limiting factor to the productivity of the public sector<sup>7,35</sup>.

Finally, it should be noted that AF involves not only a set of technical-management activities, to provide continuity

in the supply of medicines, but also clinical activities, developed through patient-centered services, in order to promote the proper use of medicines and to obtain positive clinical results<sup>36</sup>. Thus, it is necessary to make progress in the evaluation and implementation of AF policies and programs, which are guided by the principles and guidelines of SUS, guarantee access to and rational use of medicines, effectively allocating public resources.

This study presents limitations, among them, the source of data collection, since the users' reports on the medications in use and the sources of obtaining are subject to memory bias, although the interviewee was asked to prescribe the medication for continuous use. Since this is a cross-sectional design, the availability of medications found in this study cannot be considered constant. In assessing a single dimension of access to medicines (availability), the study is limited to the multidimensional evaluation of the process, which goes beyond the simple offer of the product<sup>10</sup>. However, most studies on access to medicines in Brazil use availability indicators and are based on users' reports, probably due to the greater ease of obtaining these data<sup>4</sup>.

#### 4 Conclusion

The findings of this study reveal that most users presented worrying clinical conditions for the control of hypertension and prevention of cardiovascular events, the latter being the ones which used medications the most. The access to the medications was preferably through the FHS-related drugstores and was significantly associated with income, blood pressure values and obesity. However, the private drugstore was also one of the most widely used sources of medication for the study population, especially when there was a shortage in the FHS-related drugstores.

Thus, the need for integral care to hypertensive patients is evidenced, with interventions aimed not only at the proper use of medications, but at promoting healthier life habits, preventing cardiovascular events and contributing to the quality of life of individuals. Furthermore, the analysis of the sources of obtaining medications demonstrates the important role of SUS in providing access to these products, indicating the need for improvement in public pharmaceutical assistance, in order to guarantee the quality use of medicines. However, one should point to a model of pharmaceutical assistance that is economically viable, but that is consistent with the public health reality in Brazil, and inspiration is possible in other existing models.

#### References

1. Malachias MVB, Souza WKS, Plavnik FL, Rodrigues CIS, Brandão AA, Neves MF. 7a Diretriz Brasileira de Hipertensão Arterial. *Arq Bras Cardiol* 2016;107(3):1-83. doi: <http://dx.doi.org/10.5935/abc.20160152>
2. World Health Organization. A global brief on Hypertension - World Health Day 2013. Disponível em: [https://apps.who.int/iris/bitstream/handle/10665/79059/WHO\\_DCO\\_](https://apps.who.int/iris/bitstream/handle/10665/79059/WHO_DCO_)

WHD\_2013.2\_eng.pdf;jsessionid=848A3EF1ACA331E56ECB  
C79143F3303F?sequence=1

3. Costa JMBS, Silva MRF, Carvalho EF. Avaliação da implantação da atenção à hipertensão arterial pelas equipes de Saúde da Família do município do Recife (PE, Brasil). *Cienc Saude Colet* 2011;16(2):623-33. doi: <http://dx.doi.org/10.1590/S1413-81232011000200026>
4. Álvares J, Araújo VE, Izidoro JB, Dias CZ, Costa KS, Costa EA, et al. Estamos de fato medindo acesso? Revisão sistemática das medidas de acesso a medicamentos no Brasil. *Rev Bras Pesq* 2015;17(4):138-55. doi: <https://doi.org/10.21722/rbps.v17i4.14341>
5. Brasil. Ministério da Saúde. Política Nacional de Atenção Básica. Brasília: MS; 2012.
6. Luiza VL, Chaves LA, Campos MR, Bertoldi AD, Silva RM, Bigdeli M, et al. Applying a health system perspective to the evolving Farmácia Popular medicines access programme in Brazil. *BMJ Glob Heal* 2018;2. doi: <http://dx.doi.org/10.1136/bmjgh-2017-000547>
7. Garcia MM, Guerra Júnior AA, Acúrcio F de A. Avaliação econômica dos Programas Rede Farmácia de Minas do SUS versus Farmácia Popular do Brasil. *Cienc Saude Coletiva* 2017;22(1):221-33. doi: <http://dx.doi.org/10.1590/1413-81232017221.15912015>
8. Bahia. Comissão Intergestores Bipartite da Bahia. Resolução CIB nº 34/2008. Aprova a criação do Programa Medicamento em Casa na esfera Estadual, Edição 19633, 20 de fevereiro de 2008. Disponível em: <http://dovirtual.ba.gov.br/egba/reader2/>
9. Silva RM, Caetano R. Programa “Farmácia Popular do Brasil”: caracterização e evolução entre 2004-2012. *Cienc Saude Colet* 2015;20(10):2943-56. doi: <http://dx.doi.org/10.1590/1413-812320152010.17352014>
10. Pechansky R, Thomas JW. The concept of access: definition and relationship to consumer satisfaction. *Med Care* 1981;19(2):127-40. doi: <https://doi.org/10.1097/00005650-198102000-00001>
11. Travassos C, Martins M. Uma revisão sobre os conceitos de acesso e utilização de serviços de saúde. *Cad Saude Publica* 2004;190-8. doi: <http://dx.doi.org/10.1590/S0102-311X2004000800014>
12. Almeida PHRF, Leão IN, Oliveira BG de, Fernandes BD, Álvares J, Silva WC, et al. Regime terapêutico e qualidade de vida de pacientes hipertensos. *Rev Aten Saude* 2018;16(58):17-28. doi: <https://doi.org/10.13037/ras.vol16n58.5331>
13. Brasil. Ministério da Saúde. Hipertensão arterial sistêmica. Sistema de Informação em Atenção Básica. Brasília: MS; 2014.
14. Melchioris AC, Correr CJ, Pontarolo R, Santos FODDS, Souza RADPE. Qualidade de vida em pacientes hipertensos e validade concorrente do Minichal-Brasil. *Arq Bras Cardiol* 2010;94(3):357-64. doi: <http://dx.doi.org/10.1590/S0066-782X2010000300013>
15. World Health Organization. Anatomical Therapeutic Chemical (ATC) classification index with Defined Daily Doses (DDD's). Oslo: WHO Collaborating Centre for drug Statistics Methodology; 2000.
16. World Health Organization. Obesity: Preventing and Managing the Global Epidemic. WHO Technical Report Series. Geneva: WHO; 2000.
17. Gontijo MF, Ribeiro AQ, Klein CH, Rozenfeld S, Acúrcio FA. Uso de anti-hipertensivos e antidiabéticos por idosos: inquérito em Belo Horizonte, Minas Gerais, Brasil. *Cad Saude Publica* 2012;28(7):1337-46. doi: <http://dx.doi.org/10.1590/S0102-311X2012000700012>
18. Aiolfi CR, Alvarenga MRM, Moura CS, Renovato RD. Adesão ao uso de medicamentos entre idosos hipertensos. *Rev Bras Geriatr Gerontol* 2015;18(2):397-404. doi: <http://dx.doi.org/10.1590/1809-9823.2015.14035>
19. Pereira VOM, Acúrcio FA, Guerra Júnior AA, Silva GD, Cherchiglia ML. Perfil de utilização de medicamentos por indivíduos com hipertensão arterial e diabetes mellitus em municípios da Rede Farmácia de Minas. *Cad Saude Publica* 2012;28(8):1546-58. doi: <http://dx.doi.org/10.1590/S0102-311X2012000800013>
20. Costa CMFN, Silveira MR, Acúrcio FA, Guerra Junior AA, Guibu IA, Costa KS, et al. Use of medicines by patients of the primary health care of the Brazilian Unified Health System. *Rev Saude Publica* 2017;51(suppl.2):1-11. doi: <http://dx.doi.org/10.11606/s1518-8787.2017051007144>
21. Obreli-Neto PR, Nobili A, De Oliveira Baldoni A, Guidoni CM, De Lyra DP, et al. Adverse drug reactions caused by drug-drug interactions in elderly outpatients: A prospective cohort study. *Eur J Clin Pharmacol* 2012;68(12):1667-76. doi: <https://doi.org/10.1007/s00228-012-1309-3>
22. Patel PS, Rana DA, Suthar J V, Malhotra SD, Patel VJ. A study of potential adverse drug-drug interactions among prescribed drugs in medicine outpatient department of a tertiary care teaching hospital. *J Basic Clin Pharm* 2014;5(2):44. doi: <https://doi.org/10.4103/0976-0105.134983>
23. Mibielli P, Rozenfeld S, Matos GC, Acúrcio FA. Interações medicamentosas potenciais entre idosos em uso dos anti-hipertensivos da Relação Nacional de Medicamentos Essenciais do Ministério da Saúde do Brasil. *Cad Saude Publica* 2014;30(9):1947-56. doi: <http://dx.doi.org/10.1590/0102-311X00126213>
24. Antimisiaris D, Cutler T. Managing Polypharmacy in the 15-minute office visit. *Prim Care - Clin Pract* 2017;44(3):413- 28. doi: <https://doi.org/10.1016/j.pop.2017.04.003>
25. Mengue SS, Bertoldi AD, Ramos LR, Farias MR, Oliveira MA, Tavares NUL, et al. Access to and use of high blood pressure medications in Brazil. *Rev Saude Publica*. 2016;50(supl 2):1-9. doi: <http://dx.doi.org/10.1590/s1518-8787.2016050006154>
26. Barreto MNCS, Cesse EÂP, Lima RF, Marinho MGS, Specht YS, Carvalho EMF, et al. Análise do acesso ao tratamento medicamentoso para hipertensão e diabetes na Estratégia de Saúde da Família no Estado de Pernambuco, Brasil. *Rev Bras Epidemiol* 2015;18(2):413-24. doi: <http://dx.doi.org/10.1590/1980-5497201500020010>
27. James PA, Oparil S, Carter BL, Cushman WC, Dennison-Himmelfarb C, Handler J, et al. Evidence-based guideline for the management of high blood pressure in adults. *JAMA* 2014;311(5):507. doi: [doi:10.1001/jama.2013.284427](https://doi.org/10.1001/jama.2013.284427)
28. Brasil. Ministério da Saúde. Plano de Reorganização da atenção à Hipertensão Arterial e ao Diabetes Mellitus. Brasília: MS; 2001.
29. Nascimento RCRM do, Álvares J, Guerra Junior AA, Gomes IC, Costa EA, Leite SN, et al. Disponibilidade de medicamentos essenciais na atenção primária do Sistema Único de Saúde. *Rev Saude Publica* 2017;51(Supl 2:10s):1-12. doi: <http://dx.doi.org/10.11606/s1518-8787.2017051007062>
30. Costa KS, Francisco PMSB, Barros MBA. Utilização e

- fontes de obtenção de medicamentos: um estudo de base populacional no Município de Campinas, São Paulo, Brasil. *Cad Saúde Pública* 2016;32(1):1-12. doi: <http://dx.doi.org/10.1590/0102-311X00067814>
31. Costa KS, Francisco PMSB, Barros MBA. Conhecimento e utilização do Programa Farmácia Popular do Brasil: estudo de base populacional no município de Campinas- SP. *Epidemiol Serv Saúde* 2014;23(3):397-408. doi: <http://dx.doi.org/10.5123/S1679-49742014000300003>
  32. Pinto CDBS, Miranda ES, Emmerick ICM, Costa NDR, Castro CGSO. Preços e disponibilidade de medicamentos no Programa Farmácia Popular do Brasil. *Rev Saude Publica* 2010;44(4):611-9. doi: <http://dx.doi.org/10.1590/S0034-89102010005000021>
  33. Emmerick ICM, Nascimento JM, Pereira MA, Luiza VL, Ross-Degnan D. Farmácia popular program: changes in geographic accessibility of medicines during ten years of a medicine subsidy policy in Brazil. *J Pharm Policy Pract* 2015;8(1):1-10. doi: [10.1186/s40545-015-0030-x](https://doi.org/10.1186/s40545-015-0030-x)
  34. Conselho Nacional de Secretarias Municipais de Saúde. Nota Informativa no18/2017. Informa sobre o encerramento da Rede Própria do Programa Farmácia Popular do Brasil. Brasília: CONASEMS; 2017.
  35. Silva RM, Caetano R. Costs of public pharmaceutical services in Rio de Janeiro compared to Farmácia Popular Program. *Rev Saude Publica* 2016;50:1-11. doi <http://dx.doi.org/10.1590/s1518-8787.2016050006605>
  36. Correr CJ, Otuki MF, Soler O. Assistência farmacêutica integrada ao processo de cuidado em saúde: gestão clínica do medicamento. *Rev Pan-Amazônica Saúde* 2011;2(3):41-9. doi: <http://dx.doi.org/10.5123/S2176-62232011000300006>