

# Commodities and Socioeconomic Profile of Hypertensive People Registered in the Family Health Strategy Units of Diamantina/MG: Methodological Pluri Cross-Sectional Study

Comorbidades e perfil socioeconômico de hipertensos cadastrados nas unidades de estratégias de saúde da família de diamantina/mg: estudo transversal plurimetodológico

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## Abstract

**Introduction:** Arterial Hypertension (AH) is a multifactorial condition prevalent worldwide, mainly in the population over 60 years old. AH is related to risk factors comorbidities, such as coronary heart disease, diabetes, hyperlipidemia, among others. **Objective:** To assess the prevalence of comorbidities in people diagnosed with Arterial Hypertension registered in the Family Health Strategy in the urban area of the municipality of Diamantina, Minas Gerais – Brazil. **Materials and methods:** This is a cross-sectional, plurimethodological study with a quantitative approach involving 562 people with Hypertension, of both sexes, aged 40 years or over (40-59 years old) and older adults (60 years old or more). An interview script was structured especially for the research and used to collect the information. The Sphinx Léxica software was used for analysis. **Results:** Our study found that among the most common comorbidities in hypertensive patients are musculoskeletal disorders, cardiovascular disease, dyslipidemia, diabetes, and health disorders. A significant relationship was observed between the sex of the participants and comorbidities associated with Arterial Hypertension, being more prevalent in women. **Conclusion:** The results found a higher prevalence of risk factors and unhealthy habits in the population studied, showing the importance of establishing public policies directed to the vulnerability of women to AH and its comorbidities and developing measures aimed at physiology, culture, mindset, and acting. Further studies with this purpose should thus punctuate practices more effectively, especially to approach the female population with this disease.

**Keywords:** hypertension. family health strategy. blood pressure. risk factors.

## Resumo

**Introdução:** A Hipertensão Arterial (HA) é uma condição multifatorial e altamente prevalente no mundo, principalmente na população acima dos 60 anos. Está relacionada a fatores de risco e comorbidades, como doenças coronarianas, diabetes, hiperlipidemia, arteriosclerose, infarto cerebral, entre outras. **Objetivo:** Avaliar a prevalência de comorbidades em pessoas diagnosticadas com Hipertensão Arterial cadastradas nas Estratégias de Saúde da Família – localizadas nas áreas urbanas do município de Diamantina, Minas Gerais – Brasil. **Materiais e Métodos:** Esse estudo transversal,

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plurimetodológico, de abordagem quantitativa, envolveu 562 pessoas com Hipertensão Arterial, de ambos os sexos, com idade a partir de 40 anos. Um roteiro de entrevista foi estruturado especialmente para a pesquisa e utilizado para a coleta das informações. Utilizou-se o software *Sphinx Léxica* para a realização das análises. **Resultados:** Constatou-se que dentre as comorbidades mais frequentes estão as osteomusculares, cardiovasculares, dislipidemia, diabetes e transtornos de saúde mental. Houve relação significativa entre o sexo dos participantes e as comorbidades associadas à Hipertensão Arterial, sendo mais prevalente nas mulheres. **Conclusão:** Os resultados encontrados validaram maior prevalência de fatores de risco e hábitos não saudáveis na população estudada. Portanto, verifica-se a importância de políticas públicas que tenham como referência a vulnerabilidade apresentada pelas mulheres em relação à HA e suas comorbidades, estabelecendo medidas voltadas para a fisiologia, cultura, modo de pensar e agir. Logo, sugere-se que estudos com esse propósito sejam desenvolvidos a fim de pontuar práticas com maior efetividade, principalmente para a abordagem da população feminina portadora dessa enfermidade.

**Palavras-chave:** hipertensão; estratégia de saúde da família; pressão arterial; fatores de risco.

## Introduction

Arterial Hypertension (AH) is characterized as a multifactorial clinical condition determined by a sustained increase in blood pressure levels, which may be associated with metabolic diseases and functional or structural changes in target organs<sup>1</sup>. Although the Brazilian Society of Cardiology<sup>2</sup> characterizes AH as Systolic Blood Pressure (SBP)  $\geq 140$  mmHg and/or Diastolic Blood Pressure (DBP)  $\geq 90$  mmHg, other associations such as the American College of Cardiology (ACC)/American Heart Association (AHA) and the European Society of Cardiology (ESC)/European Society of Hypertension (ESH) have different classifications, being  $>130/80$  mmHg for ACC/AHA and  $>140/90$  mmHg for ESC/ESH<sup>3,4,5,6</sup>.

AH is the main modifiable risk factor for cardiovascular disease and premature death worldwide<sup>7</sup> and is independently associated with events such as cerebrovascular accident (CVA), acute myocardial infarction (AMI), heart failure (HF), peripheral arterial disease (PAD), and fatal and non-fatal chronic kidney disease (CKD)<sup>4</sup>. The prevalence of AH is rising globally, especially in low- and middle-income countries<sup>7</sup> and with increasing age, ranging from a 27% increase between people under 60 years old and 74 % among those over 80 years old<sup>8,5</sup>. In Brazil, several population

surveys have shown that AH has a high prevalence, ranging from 14 to 34% in the adult population<sup>9,10,11,12,13</sup>. Its self-reported prevalence was 24.1% among adults ( $\geq 18$  years old) living in Brazilian capital cities and the Federal District, increasing with age and reaching 60.4% among people aged 65 years and over<sup>14</sup>.

The risk factors that can influence AH levels are age, sex, ethnicity, body weight, excessive salt intake, alcohol intake, physical inactivity, socioeconomic factors, and genetic factors<sup>4</sup>. AH can be aggravated by the presence of dyslipidemia, glucose intolerance, and Diabetes Mellitus (DM)<sup>4,7</sup>, with hyperlipidemia and DM being associated with resistant hypertension<sup>15</sup>. Furthermore, many chronic conditions are more prevalent in adults with hypertension than in healthy individuals, being associated with obesity (60.1%), dyslipidemia (57.6%), and diabetes (45.1%)<sup>16</sup>. Those with hypertension also have a high prevalence of multiple comorbidities<sup>16</sup>.

Directly or indirectly, AH accounts for 50% of deaths from cardiovascular disease (CVD), which was the leading cause of death in Brazil in 2013 (29.8% of the 1.138,670 deaths recorded). CVDs are the cause of several hospitalizations, generating high socioeconomic costs. They are responsible for 45% of cardiac deaths and 51% of deaths from stroke<sup>17</sup>.

Considering the importance of AH, individuals with comorbidities have a

higher risk of morbidity and mortality and the pharmacological prescription for their treatment requires more attention<sup>17</sup>. Identifying the comorbidities associated with patients with AH is therefore essential to minimize damage and establish protocols for the care of these patients. This study thus aimed to assess the prevalence of comorbidities in people diagnosed with AH registered in the Family Health Strategies (FHS) in the urban area of the municipality of Diamantina, Minas Gerais – Brazil.

## **Materiais e Métodos**

### **Study design**

This is a cross-sectional, pluri-methodological study with a quantitative approach involving 562 people diagnosed with Arterial Hypertension (AH), of both sexes, considered middle-aged ( $\geq 40$  to 59 years old) or older adult (60 years old or older), registered in the FHS in the urban area of the municipality of Diamantina, Minas Gerais – Brazil.

The sample was established according to the minimum sample calculation based on the population of the municipality, estimated at 47,723 inhabitants<sup>18</sup>. A standard error of 3% was assumed to establish the sample size, with a confidence interval of 97% and a proportion of 13.7%. For participant selection, a survey was conducted on the number of people with AH registered with the FHS. After the survey, a random sampling stratified by age groups (40-49 years old, 50-59 years old, 60-69 years old, and 70 years old or more) was conducted to establish the minimum sample size.

### **Research Design**

An interview script was used to collect participants' information, including: (i) sociodemographic data and socioeconomic indicators (age; color/ethnicity; literacy; marital status;

schooling; current working condition; income); (ii) access to basic services (piped water; paved street); (iii) risk factors (active smoker; passive smoker; use of alcoholic beverages; practice of physical exercises); and (iv) associated comorbidities (musculoskeletal disorders; cardiovascular disease; dyslipidemia; diabetes; psychological disease; renal disease; respiratory disease; cancer).

### **Inclusion and Exclusion Criteria**

Participants included were those registered in the FHS, of both sexes, with Arterial Hypertension, aged 40 years or older, using antihypertensive drugs for longer than six months. Based on the data collected from the printed medical records, those diagnosed with some cognitive deficit or whose functional status was “partially dependent” (lucid individuals, but with chronic debilitating physical conditions of medical or emotional nature, without social support, unable to maintain full independence) or “totally dependent” (individuals whose abilities were affected by debilitating, chronic, medical, and/or emotional physical conditions and who cannot maintain their autonomy) were excluded from the study. Those who agreed to participate in the research but refused to sign the informed consent form – ICF were also excluded.

### **Procedures**

We visited the ten FHS units to survey people diagnosed with AH registered in the units and to compose the analytical sample. Six volunteer interviewers were trained for the data collection stage to minimize interference in the process. All interviewers were prepared for home visits and presentations to invite participants to the study, signing the informed consent form, providing other information deemed necessary, and conducting the interviews. Data was collected from November 2018 to January

2020. To preserve the identity of the participants, the interviews were identified by the launch number of the questionnaire in the Sphinx Lexica Software.

### Data analysis

Data were processed and analyzed using the software Sphinx Léxica.

### Ethical Aspects

To conduct this study, a prior request was made to the Coordination of Primary Care and later authorized by the Municipal Health Department and approved by the Research Ethics Committee (REC) of the Universidade Federal dos Vales do Jequitinhonha e Mucuri in accordance with the Regulatory Guidelines and Norms for Research Involving Human Beings of the National Council of Health, Resolution 466/12<sup>19</sup>, under opinion no. 2.478.852.

## Results

Table 1 presents the social data of the 562 study participants. The mean age for both sexes was 62 years (SD = 10.05 vs 9.7). Most participants were female (63.3%), of mixed race/ethnicity (57.7%), and married (59.8%). Table 2 presents the data on schooling, working conditions, and income. Most of the participants were literate (90.6%), retired (57.2%), and earned up to one minimum wage (59.7%). As for schooling, 27.4% claimed to be illiterate or with incomplete elementary school, 28.4% women were illiterate or had incomplete elementary school, and 24.7% men had elementary school or incomplete middle school.

The  $\chi^2$  test indicated a very significant relationship between the variables sex and marital status [ $\chi^2 = 60.60$ ;  $gl = 4$ ;  $p < 0.01$ ], sex and schooling [ $\chi^2 = 17.62$ ;  $gl = 4$ ;  $p = 0.001$ ], gender and current working condition [ $\chi^2 = 49.95$ ;  $gl = 4$ ;  $p < 0.01$ ], and between sex and income [ $\chi^2 = 24.49$ ;  $gl = 4$ ;  $p < 0.01$ ] (Tables 1 and 2).

**Table 1** – Social data of people with Arterial Hypertension registered in the Family Health Strategies, Diamantina/MG, 2020.

Variables	Female		Male	
	N	% cit.	N	% cit.
<b>Age</b>				
40 to 49 years	42	11.8%	20	9.7%
50 to 59 years	111	31.2%	62	30.1%
60 to 69 years	113	31.7%	69	33.5%
70 or over	90	25.3%	55	26.7%
<b>Total</b>	<b>356</b>	<b>100.0%</b>	<b>206</b>	<b>100.0%</b>
<b>Race/Ethnicity</b>				
Asian	8	2.2%	1	0.5%
White	78	21.9%	42	20.4%
Mixed-race	205	57.6%	117	56.8%
Black	65	18.3%	46	22.3%
<b>Total</b>	<b>356</b>	<b>100.0%</b>	<b>206</b>	<b>100.0%</b>
<b>Marital Status</b>				
Married	175	49.2%	161	78.2%

Divorced/Separated	35	9.8%	18	8.7%
Single	55	15.4%	15	7.3%
Stable Union/Cohabitation/Cohabitant	14	3.9%	8	3.9%
Widower	77	21.6%	4	1.9%
<b>Total</b>	<b>356</b>	<b>100.0%</b>	<b>206</b>	<b>100.0%</b>

**Source:** Field research; **Author:** Elaborated by the authors.

**Table 2** – Data of education, work conditions, and income of people with Arterial Hypertension registered in the Family Health Strategies, Diamantina/MG, 2020.

Variables	Female		Male	
	N	% cit.	N	% cit.
<b>Literacy</b>				
Yes	323	90.7%	186	90.3%
No	33	9.3%	20	9.7%
<b>Total</b>	<b>356</b>	<b>100.0%</b>	<b>206</b>	<b>100.0%</b>
<b>Schooling</b>				
Illiterate/Incomplete Elementary School	101	28.4%	50	24.3%
Elementary School / Incomplete Middle School	88	24.7%	61	29.6%
Complete Elementary School/Incomplete High School	41	11.5%	30	14.6%
Complete High School / Incomplete High School	65	18.3%	52	25.2%
Higher Education	61	17.1%	13	6.3%
<b>Total</b>	<b>356</b>	<b>100.0%</b>	<b>206</b>	<b>100.0%</b>
<b>Current Working Condition</b>				
Retired	178	49.0%	128	60.4%
Active	66	18.0%	65	30.7%
Unemployed	64	18.0%	13	6.1%
Pensioner	41	11.0%	0	0.0%
Removed	14	4.0%	6	2.8%
<b>Total</b>	<b>363</b>	<b>100.0%</b>	<b>212</b>	<b>100.0%</b>
<b>Income</b>				
Up to a Minimum Wage	235	66.0%	97	47.1%
From one to two Minimum Wages	53	14.9%	43	20.9%
From two to three Minimum Wages	30	8.4%	22	10.7%
From three to four Minimum Wages	17	4.8%	12	5.8%
Above four Minimum Wages	21	5.9%	32	15.5%
<b>Total</b>	<b>356</b>	<b>100.0%</b>	<b>206</b>	<b>100.0%</b>

**Source:** Field research; **Author:** Elaborated by the authors.

Regarding the risk factors for self-reported hypertension, most patients did not active smoke (89.9%) nor passive smoke (80.8%). The prevalence of alcohol use was 42.4%, being mostly reported by

men (55.3%). Regarding the practice of physical activity, 54.0% of participants were sedentary, of which most were women (55.3%) (Table 3).

**Table 3** – Risk factors and self-reported comorbidities by people with Arterial Hypertension registered in the Family Health Strategies, Diamantina/MG, 2020.

Variables	Yes		No	
	N	% cit.	N	% cit.
<b>Active Smoker</b>				
Yes	34	9.6%	28	13.6%
No	322	90.4%	178	86.4%
<b>Total</b>	<b>356</b>	<b>100.0%</b>	<b>206</b>	<b>100.0%</b>
<b>Passive Smoker</b>				
Yes	74	20.8%	39	18.9%
No	282	79.2%	167	81.1%
<b>Total</b>	<b>356</b>	<b>100.0%</b>	<b>206</b>	<b>100.0%</b>
<b>Use of Alcoholic Beverage</b>				
Abstinence	236	66.3%	92	44.7%
Non-abstinence	120	33.7%	114	55.3%
<b>Total</b>	<b>356</b>	<b>100.0%</b>	<b>206</b>	<b>100.0%</b>
<b>Practice of Physical Exercises</b>				
No	197	55.3%	101	49.0%
Yes	159	44.7%	105	51.0%
<b>Total</b>	<b>356</b>	<b>100.0%</b>	<b>206</b>	<b>100.0%</b>
<b>Comorbidities*</b>				
Musculoskeletal	209	27.5%	102	26.1%
Cardiovascular	99	13.0%	61	15.6%
Dyslipidemia	106	13.9%	53	13.6%
Diabetes	95	12.5%	53	13.6%
None	62	8.1%	51	13.0%
Psychological	73	9.6%	11	2.8%
Other, please indicate...	54	7.1%	20	5.1%
Kidney	31	4.1%	20	5.1%
Respiratory	27	3.5%	19	4.9%
Cancer	5	0.7%	1	0.3%
<b>Total</b>	<b>761</b>	<b>100.0%</b>	<b>391</b>	<b>100.0%</b>

**Source:** Field research; **Author:** Elaborated by the authors; Respondents 562; \*Multiple responses.

The  $\chi^2$  test indicated a very significant relationship between alcohol use and sex [ $\chi^2 = 25.13$ ;  $gl = 1$ ;  $p = <0.01$ ] and a significant relationship between sex

and physical exercise [ $\chi^2 = 6$ ;  $df = 1$  (S);  $p = 0$ ]. The test also identified a little significant relationship between sex and being a smoker [ $\chi^2 = 2$ ;  $gl=1$ ;  $p = 0$ ] and

no relationship between sex and being a passive smoker [ $\chi^2 = 0.28$ ;  $gI = 1$  ( $p = 0.60$ )].

In the selected sample, the main comorbidities self-reported by the participants were musculoskeletal disorders (27.0%), other cardiovascular diseases (13.9%), dyslipidemia (13.8%), DM (12.8%), and psychological diseases (7.3%). Renal (4.5%), respiratory (4.0%), and oncological (0.5%) diseases were also reported. About 9.8% of participants reported not having any comorbidity. Notably, the  $\chi^2$  test indicated that the relationship between sex and comorbidities was very significant [ $\chi^2 = 28$ ;  $df = 9$  (MS);  $p = 0$ ].

## Discussion

Most of the study participants were women, older, of mixed-race, married, literate (incomplete elementary school), retired, and earned up to one minimum wage. In a study conducted with 133 participants of an FHS in the Federal District<sup>20</sup> to analyze the blood pressure control of hypertensive older adults, most participants were also women, with a mean age of 63.2 years, income of one to one year, two minimum wages, married and retired, and with an average of 6.9 years of schooling<sup>20</sup>, which indicates incomplete basic education. Another study carried out in Montes Claros – MG<sup>21</sup> sought to estimate self-reported AH in a sample of 2150 people, finding a higher prevalence of AH among women (63.3%), married (76%), with no higher education, and a mean age between 18 and 59 years old<sup>21</sup>. These results corroborate the literature, which shows that the risk of being diagnosed with arterial hypertension increases with age due to physiological changes caused by aging<sup>21,4</sup>. When analyzing the relationship between hypertension and quality of life, the authors also found that hypertensive women had worse quality of life than hypertensive men. Furthermore, another

study showed that female participants had fewer years of schooling and used more psychotropic medications than male participants<sup>22</sup>.

When analyzing the prevalence of self-reported hypertension by Brazilian adults, researchers identified, based on data from the National Household Sample Survey (PNAD) for 1998, 2003, and 2008, a relationship between lower schooling and diagnosis of arterial hypertension, with a similar pattern for men and women both in the crude and relative analysis even though most participants were women<sup>21</sup>. Others, in turn, claim that a higher prevalence of AH is related to age group (among older adults), years of schooling, and the female gender, increasing by almost eight times in those with lower schooling<sup>23</sup>. This findings corroborate those presented by the VII Brazilian Guideline of Arterial Hypertension<sup>17</sup>, which states that adults with little or no schooling have a higher prevalence of self-reported hypertension. Our findings also indicate a very significant relationship between sex and schooling, showing that this research is relevant for healthcare professionals working in Primary Health Care in the municipality of Diamantina<sup>4</sup>.

Our study found a very significant relationship between the female sex and comorbidities associated with AH. Moreover, research<sup>24</sup> on the risk factors associated with AH indicated that female biological factors may prevent a more significant clinical improvement. The list of preventive actions for women's health must therefore focus on AH and its higher risk of death from comorbidities in women (compared to men).

Polypathology is a risk factor for morbidity and mortality, especially in older adults. Researchers state that AH is significantly correlated to outcomes of circulatory diseases, being the most important risk factor and causing premature and preventable deaths in Brazil<sup>25</sup>. Cardiovascular problems are aggravated in patients who have

dyslipidemia, arterial hypertension, and diabetes concomitantly. Patients reported these and other comorbidities – musculoskeletal disorders, psychological diseases – in the interviews, which can indicate an alert for them and for municipal managers. These data have national importance and can be used as a reference for creating public policies aimed at prevention and comprehensive health care for the population.

The comorbidities identified among the study participants included musculoskeletal conditions such as back pain and osteoarthritis, which can be associated with both aging and obesity. Gijón-Conde<sup>26</sup> investigated the relationship between frailty and dysfunction in people with hypertension (presenting three or more of the following factors: weight loss, low grip strength, low energy, low gait speed, and low physical activity) using the Lawton-Conde questionnaire. Brodýs on instrumental activities of daily living in people with hypertension. It also identified a trend in frail older adults towards higher nocturnal blood pressure as well as a slower decline in daytime pressure, with fluctuations possibly related to cardiovascular events. In this study, Gijón-Conde<sup>26</sup> inferred that both frailty and dysfunction, which are related to aging and the presence of a comorbidity (cardiovascular events), increased nocturnal blood pressure. An observational study aimed at assessing the prevalence of resistant hypertension and its association with cardiovascular disease and other diseases<sup>15</sup> found that 53% of one of its subgroups (with 55 patients) had been diagnosed with diabetes mellitus and 83% with hyperlipidemia. The authors concluded that the high prevalence of these diseases suggests that other cardiovascular

risk factors are pathogenic to the most severe form of hypertension since endothelial dysfunction and vascular damage possibly deteriorate the main blood pressure controlling mechanisms.

## Conclusion

Data collection and analysis show that this study achieved its objective since it identified the comorbidities associated with hypertensive patients, a population that needs special attention from the medical prescription to the longitudinal monitoring by the FHS team. The survey data confirm a higher prevalence of risk factors and unhealthy lifestyle habits in the population with hypertension, especially among women. These emphasize the importance of public policies directed to the vulnerability of women to AH and comorbidities. Measures must be established for the physiology, culture, mindset, and acting of women using creative strategies and reassessing conducts and measuring results to achieve comprehensive care, not just government goals. We found no studies that reported a significant relationship between sex and comorbidities; our study, however, might have found a prevalence of comorbidities in women since they seek health services more than men. Creating strategies to raise awareness about the prevention of diseases and effective treatment of their pathologies is therefore essential, emphasizing self-care as a predictor of disease. Since few studies can guide professionals about different approaches for various audiences, further research should describe more effective practices to approach arterial hypertension, especially for women and their nuances.

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### **Conflict of interest**

The authors declare no conflict of interest.

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