



RESEARCH ARTICLE

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## INFLUENCE OF SOCIAL AND CLINICAL FACTORS ON ADHERENCE TO DRUG THERAPY IN HYPERTENSIVE INDIVIDUALS

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### ARTICLE INFO

#### Article History:

Received 29<sup>th</sup> May, 2019  
Received in revised form  
27<sup>th</sup> June, 2019  
Accepted 19<sup>th</sup> July, 2019  
Published online 28<sup>th</sup> August, 2019

#### Key Words:

Hypertension;  
Adhesion to Medication;  
Ambulatory Care.

### ABSTRACT

To evaluate the therapeutic adherence of hypertensive individuals in ambulatory follow-up and its relationship with social and clinical characteristics. Method: A descriptive, quantitative and transversal study, conducted with 162 people with hypertension, in a specialized outpatient follow-up. It was applied to Morisky Medication Adherence Scale (MMAS-8). In the analysis, descriptive and inferential statistics were used. Results: Similarities were found in the adherence score between the groups in relation to gender, age, schooling, skin color, family arrangement and work situation. There was no significant relationship between the social and clinical variables investigated. Prevalence was low (54.9%), with a mean score of 4.43. The factors that most interfered in adherence were: difficulty remembering to take the medications (61.7%); forget to drink (43.8%); and forget to take the medicines when leaving home (21%). Conclusion: There was a low adherence to drug treatment among participants, and the 'forgetting' variable was the main barrier to adherence to treatment. It is suggested interventions that aim to decrease forgetfulness for this population.

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**Citation:** Taciana da Costa Farias Almeida, Mailson Marques de Sousa et al. 2019. "Influence of social and clinical factors on adherence to drug therapy in hypertensive individuals", *International Journal of Development Research*, 09, (08), 29178-29183.

## INTRODUCTION

Approximately 36 million Brazilian adults live with the diagnosis of Systemic Arterial Hypertension (SAH), a condition that increases the number of hospital admissions with consequent socioeconomic costs and contributes directly or indirectly to 50% of Cardiovascular Disease (CVD) deaths (Malachias, 2016). The clinical follow-up of these individuals is carried out in primary health care, which registers and follows up through consultations, guidelines and prescription of medications (Mendes, 2014). In the presence of complications associated with uncontrolled pressure levels, the follow-up of this clientele should be at the secondary level in specialized outpatient clinics, with specialists in cardiology. Among the therapeutic approaches aimed at the person with SAH in outpatient follow-up, drug treatment is one of the major challenges and non-compliance with medication use

should be considered as one of the main obstacles in controlling blood pressure levels (Cruz, 2010; Gautério-Abreu, 2016 and Cavalari, 2012). Among the factors that lead to non-adherence to antihypertensive drug treatment are low socioeconomic status, low self-esteem, ineffective relationship with the health team, cost of medication, lack of access to medication, a greater number of prescription drugs and adverse events (Cruz, 2018; Gautério-Abreu, 2016 and Cavalari, 2012). The term 'adherence to treatment' refers not only to the practice of taking the drug but also to the degree of compliance with the indicated therapeutic measures, to maintain Blood Pressure (BP) at normal levels. Although advances have occurred in the last decades in the pharmacological approach of the person with SAH, the literature shows that the number of people who can maintain BP at adequate levels is low (Malachias, 2016). Few studies have sought to investigate adherence to drug therapy using the *Morisky Medication Adherence Scale* (MMAS-8) at the level of specialized outpatient care<sup>5-6</sup>. It is observed that the greatest scientific production that deals with this theme focuses on the level of

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primary care (Magnabosco, 2015; Aiolfi, 2015; Rocha, 2015 and Vieira, 2014). In this sense, the question is: What is the adherence to the antihypertensive treatment of individuals with hypertension in outpatient follow-up? and what is its relation to social and clinical factors? The survey of these data will enable us to know the barriers presented by users in the accomplishment of the drug treatment for SAH, as well as to allow the structuring of intervention focused on the difficulties encountered by hypertensive patients in the treatment management. The objective of this study was to evaluate the therapeutic adherence of people with hypertension in specialized outpatient follow-up, and its relationship with social and clinical characteristics.

## MATERIALS AND METHODS

This is a descriptive and cross-sectional study carried out in a cardiology outpatient clinic of a public and teaching hospital. The target population was composed of people with a medical diagnosis of SAH in an outpatient follow-up at the selected institution. The individuals assisted in this service are referred by the Primary Health Care and are followed up in consultations by medical cardiology, for the evaluation and therapeutic follow-up of cardiovascular diseases, among them the SAH. There is no interprofessional follow-up of the hypertensive user in this unit. Due to the impossibility of accessing the records of the hypertensive population in this unit, due to the absence of a registry database of individuals under ambulatory follow-up, convenience sampling was used according to the pre-established period for data collection. In order to include the participants in the study, the following criteria were adopted: being over 18 years of age, using oral antihypertensive drugs for at least six months (minimum period recommended to evaluate compliance with treatment), being assisted in the outpatient clinic, brachial or forearm of 22 to 32 cm, considered measures that fit the sphygmomanometer cuff available for BP measurement at the time of the research. Those individuals with hypertension who needed caregivers to offer the antihypertensive tablets were excluded, since they did not perform the self-care for the drug treatment, and those who presented barriers of cognition confirmed in medical records. The sample was selected in the period of collection proposed for the study (November to December 2017), which totaled 162 individuals with hypertension. A socio-demographic evaluation instrument was used to record the data, containing personal data, clinical data, comorbidities and modifiable risk factors of SAH. To analyze drug adherence, it was applied to *Morisky Medication Adherence Scale* (MMAS-8). It is a validated scale widely used in Brazilian studies that seek to assess the adherence to the medical treatment of SAH<sup>11</sup>. The scale is composed of eight questions with objective answers and of dichotomous character (yes/no). The degree of adherence is evaluated from the sum of the scores for each response: yes = 0 and no = 1, reversing these values in question number 5. And in question 8, the "no" is considered for those patients who reported that "Never" forget; and the "yes" for those who forget "rarely", "sometimes", "often" or "always". Thus, the total of 8 points corresponds to the high adherence; 6 to 7, medium adherence and, below 6 points, low adherence (Oliveira-Filho, 2012). An automatic sphygmomanometer was used to measure BP, of the Omron brand, model HEM-7200, validated and applied to the arm, with a cuff that adapts to the arm circumference of 22 to 32 cm, as well as an inelastic tape for measuring the arm circumference and adjust the available cuff. In those patients

with a larger arm circumference 32 cm, the cuff was applied to the right forearm. The BP measurement made it possible to classify the hypertensive patients according to the 7th Brazilian Guideline of Arterial Hypertension (7th BGAH)<sup>1</sup> according to the pressure levels in normal, prehypertension and hypertension stages 1, 2 and 3.

**Data collection followed the steps:** presentation of the researchers to the possible participants, explanation of the research objective and invitation to participate in the study; distribution of the Informed Consent Form (ICF) for reading and signing; application of data collection instruments individually and in a private room; preparation and accomplishment of three measurements of the blood pressure following the recommendations of the 7th BGAH (Malachias, 2016), considering for analysis, the average value of the last two measurements. After the data collection, the data were entered in a spreadsheet in the program *Microsoft Excel for Windows* and transported to the software *Statistical Package for the Social Science* (SPSS), version 21. Descriptive statistics were applied by absolute and relative frequencies. We used inferential statistics considering the normality of the data confirmed by the Shapiro-Wilk test. The comparison of the variables (two categories) about the averages of the adherence score was performed using the Mann-Whitney test. And, for the variables with three or more categories, the Kruskal-Wallis test was applied. To compare the proportions of the *Morisky Medication Adherence Scale* (MMAS-8) responses, the non-parametric Chi-Square test was used. The level of significance was set at 0.05. The study respected the national research guidelines involving human beings, Resolution 466 of December 12, 2012, CAAE: 75637417.7.0000.5182 and had Approval Opinion No. 2.382.258, on December 19, 2017, issued by the Ethics Committee in Search.

## RESULTS

Regarding the adherence measure, higher scores were observed for female participants, age  $\geq 60$  years, and  $> 8$  years of study, although there was no significant association (Table 1). Table 2 presents the frequency of responses of subjects with hypertension investigated. It was identified that 61.7% stated difficulties to remember to take the medicines to control blood pressure ( $p = 0.003$ ). Regarding the adherence score to the treatment of hypertensive users, the mean was  $5.78 \pm 1.83$  points. Regarding the values of the BP measurement, considering the three measures and the mean of the last two, we observed mean systolic blood pressure (SBP) of  $141.8 (\pm 20.05)$  mmHg and mean diastolic blood pressure (DBP) of  $79.52 (\pm 12.00)$  mmHg. The mean time to diagnosis of SAH was  $10.75 \pm 9.0$  years. In relation to the presence of risk factors and / or comorbidities for the development of cardiovascular diseases, the following stand out: physical inactivity (39.5%); diabetes (38.3%); dyslipidemia and smoking (28.4%), for each; AMI (14.8%); Stroke (8.6%) and alcoholism (1.2%). It is worth mentioning that some subjects had more than one risk/comorbidity factor.

## DISCUSSION

The general characteristics of the sociodemographic profile identified in this study are similar to those found in previous studies carried out at the level of outpatient care (Gautério-Abreu, 2016; Cavalari, 2012 and Martins, 2014), and in the primary care service (Ribeiro, 2015).

**Table 1. Relationship of social and clinical variables with the drug adherence score of the hypertensive individuals participating in the study. Paraíba, Brazil, 2018**

Variables	n (%)	Mean and standard deviation of the drug adherence score	p-value
Sex			
Male	64 (39.5)	5.64±1.91	0.497
Female	98 (60.5)	5.88±1.78	
Age			
< 60 years	68 (42)	5.50±1.90	0.099
≥ 60 years	94 (58)	5.99±1.76	
Schooling			
≤ 8 years of study	133 (82.1)	5.70±1.87	0.244
> 8 years of study	29 (17.9)	6.17±1.62	
Skin Color			
White	76 (46.9)	5.96±1.72	0.312
Not white	86 (53.1)	5.63±1.92	
Family arrangement			
Lives without partner	139 (85.8)	5.78±1.85	0.872
Lives with partner	23 (14.2)	5.78±1.73	
Work situation			
Active	45 (27.8)	5.87±1.72	0.821
Inactive	117 (72.2)	5.75±1.88	
Family income (minimumwages)			
None	11 (6.8)	5.82±1.83	0.282
< 1	8 (4.9)	4.88±2.16	
1- 3	140 (86.4)	5.85±1.81	
≥ 4	3 (1.9)	5.00±1.73	
Rating SAH(7th BGAH)			
Normal	22 (13.6)	5.55±2.13	0.992
Pre-hypertension	57 (35.2)	5.84±1.64	
Hypertension stage1	52 (32.1)	5.81±1.85	
Hypertension stage2	27 (16.7)	5.85±1.85	
Hypertension stage3	4 (2.5)	5.50±3.00	
Ranking			
Low adhesion	89 (54.9)	4.43±1.34	0.000*
Average adhesion	41 (25.3)	7.00±0.00	
High adhesion	32 (19.8)	8.00±0.00	

Source: Research Data; #7th Brazilian Guideline of Arterial Hypertension; \*Statistical significance (Kruskal Wallis test)

**Table 2. Distribution of individuals with hypertension according to the responses obtained with the application of Morisky Medication Adherence Scale (MMAS-8). Paraíba, Brazil, 2018**

Items Morisky Medication Adherence Scale(MMAS-8)	Yes		No		p-value
	n	%	n	%	
1. Do you sometimes forget to take your medicines for pressure?	71	43.8	91	56.2	0.116
2. In the past few weeks, have you ever taken your high blood pressure medicines?	45	27.8	117	72.2	0.000*
3. Have you stopped taking your medicine or decreased your dose without telling your doctor why you felt worse when taking the medicines?	33	20.4	129	79.6	0.000*
4. When you travel or leave home, do you sometimes forget to take your medications?	34	21.0	128	79.0	0.000*
5. Did you take your high blood pressure medications yesterday?	145	89.5	17	10.5	0.000*
6. When you feel that your pressure is controlled, do you sometimes stop taking your medications?	17	10.5	145	89.5	0.000*
7. Have you ever felt bothered by correctly following your high blood pressure treatment?	39	24.1	123	75.9	0.000*
8. How often do you find it difficult to remember to take all your medicines for pressure?	100	61.7	62	38.3	0.003*

Source: Research Data. # In question 8, the "no" was considered for those patients who said they "never" forget; and the "yes" for those who forget "almost never", "sometimes", "often" or "always"; \* Statistical significance (chi-square test)

These findings may be related to the fact that hypertensive patients referenced to specialized outpatient care are referred by the system of regulation of basic care, thus coinciding with the profile of the patients attended at the different levels of health care. The prevalence of female sex in the care of hypertensive patients is quite common, corroborating other studies of adherence to drug treatment, be they national (Wilson, 2018; Yang, 2016; Gomes, 2018 and Silva, 2018) or international (Wilson, 2018 and Yang, 2016). The female patients presented a better adherence to the drug treatment when compared to the male sex, a finding that corroborates with studies conducted in the Southeast of Brazil (Cavalari, 2012 and Martins, 2014). This finding may be associated with the fact that this population is more attentive to health care and, therefore, more frequently seek specialized care, when compared to the male population. Age is another contributing and risk factor for the development of hypertension, as well as abandonment and low adherence to drug treatment.

Studies carried out in the country have shown that hypertension affects older people, especially those older than 60 years (Malachias, 2016; Gautério-Abreu, 2016; Vieira, 2014). Hypertension in elderly people (58%) also prevailed in this study. This finding may be related to the chronicity associated with the disease and to the physiological predisposition of the elderly as having the SAH. It is also observed that many young adults do not give due importance to the self-care related to the control of hypertension, failing to take the drugs due to the absence of specific symptoms of SAH. The discontinuation in the use of the drugs coincides with a diagnosis time of approximately 10 years among the study participants, a fact that points to the use of antihypertensives by the participants of adulthood, especially after 50 years. This reflection is in line with the finding of this study, in which individuals over 60 years old presented better adherence to treatment compared to the younger ones ( $p = 0.099$ ), a result similar to that of a Brazilian study (Cavalari,

2012), which differs from another (Martins, 2014) that found better adherence among those under 50 years of age. As for schooling, 82.1% of the sample had less than eight years of schooling. The low level of education has a strong relation with medication adherence, a factor that can lead individuals with less than eight years of schooling to present a 1.3 times greater chance of not adhering to treatment (Oigman, 2014). It was observed that individuals with education over eight years (6.17 points) when compared to the others, although the difference concerning those more or less schooled was not significant ( $p = 0.244$ ), corroborating a Brazilian study (Yang, 2016). In this study, 53.1% of the individuals declared themselves to be nonwhite, similar to other Brazilian studies 6,14. It is believed that the Brazilian miscegenation is a factor that supports this self-declaration, since the participants interviewed always stated that their parents were neither white nor black, thus having a mixture of races, contributing to the majority declaring themselves not white. When purchasing the means of adherence to the treatment, it was observed for this sample, greater adhesion for the individuals of the white color, findings that coincided (v, 2014) and differed (Martins, 2014) of searches with the object of similar study. Concerning the family arrangement, 85.8% reported being accompanied, as well as in other studies (Cavalari, 2012 and Silva, 2018).

It is estimated that married hypertensives when compared with single individuals, present a twofold higher chance of adhering to the proposed treatment (Barreto, 2014). In this investigation, it was observed that the presence of companion as support and support in the incentive to the medical treatment of SAH did not interfere (adherence scores of 5.78 and  $p = 0.872$ ), as well as in another study<sup>5</sup>, since 80.2% of the sample had low to medium adherence to treatment. ( $P = 0.00$  and  $p = 0.003$ ), which could be minimized by the presence of this support network in association with the use of technological alarms. It was also observed that the largest percentage of respondents were inactive in relation to labor activities (72.2%), corroborating another study performed at the outpatient level (Martins, 2014), which identified a better adherence among the inactive, different from the findings of this study, where we found a better adherence for the individuals who were labor-intensive ( $p = 0.821$ ). The labor inactivity of the majority of participants may be related to the predominant age of individuals over 60 years of age, thus contributing to the self-declared family income of one to three Brazilian minimum wages (approximately US\$ 266.21 in 2019) family, negatively interfering with treatment adherence (score = 5.85 and  $p = 0.282$ ). Low income is a factor that has been identified as a barrier to adherence to the proposed treatment<sup>3</sup>, since users are not always able to purchase the drug through the public health network, by reason of unavailability of the offer or because they are not present at the outpatient clinic to acquire the prescription due to transportation expenses. This increases the abandonment of follow-up and, consequently, the risk of cardiovascular damage. However, the unavailability of the drug for regular use was not the subject of the *Morisky Medication Adherence Scale* (MMAS-8) study, and further research is needed to address the beliefs of this population related to the difficulties encountered in performing the prescribed blood pressure control. When applying *Morisky Medication Adherence Scale* (MMAS-8), an average score of 5.78 points (low adherence) was observed, and only 19.8% presented high adherence to the treatment, which was not expected, considering the support and complexity of the service in which they were inserted. The significant difference

between the means of the low, medium and high treatment adherence groups ( $p = 0.000$ ) was also highlighted. It was observed that "forgetting" to take the prescribed drugs was the main difficulty for drug adherence, although the variable was slightly lower when compared to the participants who reported 'not forgetting to take the medicines'. Forgetfulness can be considered a specific barrier to adhere to the prescribed therapy, especially for this population considered elderly, whereas, in this globalized world, this finding becomes more relevant as the elderly are more technologically active, being able to use of artifacts so you do not forget to take the drugs. Considering the chronicity of the disease, associated with the silent symptomatology, and because it is a continuous treatment, the antihypertensive medication may not be happening systematically in the lifestyle necessary to maintain the clinical stability of the disease. In this sense, strategies that use reminders and current technologies that involve the daily contacts of these individuals should be structured to resolve this barrier and potentiate the continuous and regular use of the medication to avoid cardiovascular complications. Although the use of the technologies is present in the homes, and more and more the elderly access them, we did not find Brazilian studies evaluating strategies aimed at remembering/encouraging/motivating individuals with hypertension to taking antihypertensive drugs, impact on adherence to the treatment of hypertension. Care technologies that aim to strengthen memory and promote self-care are strategies that have been successfully used and should be incorporated into the therapeutic approach of this population, especially given their widespread dissemination among adults and the elderly. In this sense, alarms and reminders issued by *smartphones*, mobile health care technology, are strategies used to increase adherence to medication (Thangada, 2018), and should, therefore, be incorporated into care.

It was identified in this study that 20.4% of hypertensives stopped taking their medication or decreased the dose without telling their doctor because they felt worse from the start of treatment. This finding may be related to the presence of adverse effects of the drugs or to the absence of specific symptoms of the disease, which lead to the abandonment of the treatment due to the lack of knowledge, often associated with low schooling, age, lack of a support network and fragility in the clinical care. This aspect could be tempered by providing *feedback* and information to patients about the adverse effects of the drugs and the importance of continued treatment even in the absence of disease-specific symptoms through health technologies such as applications for *smartphones*. A study conducted in the United States found that when hypertensive people know the consequences of the disease, such as stroke, heart attack and death, when family members are encouraged to take medication, they adhere better to treatment (Long, 2011). In this sense, the health professionals involved with this clientele should prioritize the presence of these positive social referents in routine consultations, to strengthen this network of support in improving the quality of life of the hypertensive individual. Another relevant aspect is the interruption of the use of the medication when feeling the pressure is controlled, informed by 10.5% of the respondents, as well as if they feel uncomfortable in correctly following their treatment of high blood pressure, referred by 24.1% of the participants. This finding may be related to the fact that SAH is a chronic disease that requires continuous treatment, with discrete and nonspecific symptomatology in most cases, thus discouraging

hypertensive patients following treatment, since they report, as a complaint, dependence on drugs to feel good. On the other hand, 89.5% reported having taken their medications for high blood pressure the previous day, a finding that may be related to the time the interview was performed. It is observed that the day before a medical consultation, it is common for users to want to present themselves as healthy and well as possible with an evaluation. Thus, and considering that service users would go through a routine medical appointment or cardiac evaluation, it is common to expect that their health will be okay. In this sense, it would be unlikely that they would not take the medication the day before the specialist consultation, which is why most of the participants may have answered this question in the affirmative. It is worth noting that BP's lack of control during the waiting period for the medical appointment may have been a negative point in the research approach, as the participants were anxious for the proximity of the meeting with the physician associated with the probable "hypertension of the white coat" (Malachias, 2016), reason why three measures were chosen, the average of the last two being calculated. Associated with this fact, most of the participants reported not having taken the tablets in the morning, especially the diuretics, due to the increase of the urinary volume during the waiting of the consultation, which can also justify the blood pressure values found.

Studies conducted in Brazil (Cavalari, 2012; Martins, 2014; Vieira, 2014; Oliveira-Filho, 2012), using the *Morisky Medication Adherence Scale* (MMAS-8), have found results similar to this study. In the present study, age associated with forgetfulness, inherent to physiological aspects of age, may have contributed to the low adherence to the prescribed medication treatment, in addition to the absence of a support network, considering the assistance of family members and health professionals to the care of these hypertensive people. It became relevant, in this study, the "forgetfulness" factor in taking the drugs prescribed to control hypertension. This barrier may be contributing to the non-adherence to the prescribed treatment and, consequently, to the uncontrolled BP. Associated with this, it should be pointed out that older participants are more predisposed to forgetfulness due to their physiological and cognitive conditions, making it difficult to take drugs correctly, especially when they do not have the support of those who reside with them. In agreement with the recommended therapeutic prescriptions to control SAH, it should be pointed out that only pharmacological therapy is not sufficient to maintain blood pressure levels within normal limits, since effective treatment is based on the sum of pharmacological and non-pharmacological therapies, including healthy activities, healthy eating habits and a low sodium diet<sup>1</sup>, which is consistent with the number of sedentary hypertensives studied (39.5%), one more factor associated with the lack of control of the blood pressure levels. Regarding risk factors for cardiovascular diseases, sedentarism prevailed, followed by Diabetes Mellitus (DM). These data become relevant insofar as the control of SAH and DM should be associated with pharmacological and non-pharmacological measures (Malachias, 2016). In this sense, it is necessary to have an enlarged view of the health team for the factors inherent in the health conditions of the respondents, especially the elderly, considering pressure levels above normality identified in a significant number of participants (86.5%). maybe related not only to low medication adherence but also to non-performance of physical activity, healthy eating and the presence of comorbidities associated with SAH, such as DM. The

measurement of BP is largely performed immediately before the medical appointment and the self-referenced measure of adherence to the drug therapy may have influenced the results obtained and may be considered as limitations of the study. The importance of longitudinal studies with randomization of the sample that can establish the factors that facilitate or make difficult the drug adherence is emphasized.

## Conclusion

The findings of this study showed similarities in the levels of adherence between the groups concerning gender, age, schooling, skin color, family arrangement and work situation. It was noted that it lowers adherence to the drug treatment of arterial hypertension, associated with lack of control of blood pressure levels for more than half of the sample, associated to the cognitive factor "forgetting" of drug intake as the main impediment to this treatment adherence. For nursing practice, the results show the need to develop studies aimed at constructing and implementing motivational strategies based on innovative care technologies that consider their clinical context, socioeconomic and social support networks.

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