ORIGINAL

Factors associated with blood pressure control in hypertensive patients

Factores asociados con el control de la presión arterial en pacientes hipertensos

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ABSTRACT

Introduction: the lack of control of blood pressure levels constitutes a serious health problem.
Objective: determine the factors associated with blood pressure control.
Method: observational, analytical, cross-sectional study, developed between 2021 and 2023, in a sample of 140 hypertensive patients, from office 59, of the Turcios Lima Polyclinic. The documentary review and the application of instruments allowed the obtaining of information that gave rise to the analyzed variables, using descriptive and inferential statistics methods.
Results: 55,0 % of the patients did not have blood pressure control, which was associated with age (p<0,001), cohabitation (p<0,001), stress level (p<0,001), trait anxiety (p<0,001) and status (p<0,001). All the risk factors evaluated showed the same behavior, with a median of 10 years since the diagnosis of the disease, with 37,9 % of the sample presenting polypharmacy. Partial adherence predominated in the study (50,7 %), being associated with pressure control (p<0,001).
Conclusions: the study allowed us to identify the factors presented by patients that are related to the control of blood pressure levels. For this purpose, the sociodemographic and psychosocial spheres were analyzed, as well as the lifestyle and clinical characteristics, which made it possible to establish the variables that affect a modification of the control of said blood pressure figures.

Keywords: Medical Care; Control; Compliance and Adherence to Treatment; Hypertension; Blood Pressure.

RESUMEN

Introducción: la ausencia de control de las cifras de presión arterial constituye una seria problemática sanitaria.
Objetivo: determinar los factores asociados con el control de la presión arterial.
Método: estudio observacional, analítico, transversal, desarrollado entre 2021 y 2023, en muestra de 140 pacientes hipertensos, del consultorio 59, del Policlínico Turcios Lima. La revisión documental y la

aplicación de instrumentos, permitieron la obtención de información que dio salida a las variables analizadas, empleándose métodos de estadística descriptiva e inferencial.

Resultados: el 55,0 % de los pacientes no tenían control de la presión arterial, asociándose ello con la edad (p<0,001), convivencia (p<0,001), nivel de estrés (p<0,001), la ansiedad rasgo (p<0,001) y estado(p<0,001). Igual comportamiento mostraron todos los factores de riesgo evaluados, teniéndose una mediana de 10 años con el diagnóstico de la enfermedad, presentando polifarmacia el 37,9 % de la muestra. La adherencia parcial predominó en el estudio (50,7 %), asociándose con el control de la presión (p<0,001). Conclusiones: el estudio permitió identificar los factores presentados por los pacientes, que guardan relación con el control de las cifras de presión arterial. Fueron para ello analizadas las esferas sociodemográfica, psicosocial, así como el estilo de vida y las características clínicas, lo que permitió establecer las variables que inciden en una modificación del control de dichas cifras tensionales.

Palabras clave: Atención Médica; Control; Cumplimiento y Adherencia al Tratamiento; Hipertensión; Presión Arterial.

INTRODUCTION

Non-communicable diseases constitute a threat to all health systems globally, given the high number of people who suffer from them, which continues to increase despite the concern and efforts that different organizations have been making to control them. In this context, a negative impact of cardiovascular diseases (CVD) is needed, and within them, high blood pressure (HTN).[1,2]

This disease, considered the silent plague of the 21st century, affects more than 1.28 billion people in the world, being responsible for 10,8 million deaths annually, the occurrence of 62 % of strokes, and 49 % of cases of ischemic coronary heart disease, being in turn one of the main responsible for years lost due to disability and premature mortality.[3-9]

Being the most common risk factor in Primary Health Care, it is understood, therefore, the implementation of multiple strategies for its control, with the reduction of blood pressure (BP) levels as a premise to reduce the risk of the appearance of unfavorable events for the health of the individual, associated with this disease. Said control, despite constituting a fundamental pillar to reduce the risk of cardiovascular disease and premature mortality; It continues to be a problem in the hypertensive population in the world. In this regard, it is estimated that less than half of the patients diagnosed and receiving treatment achieve adequate control of BP levels, which conditions the appearance of multiple complications, as well as significant health, economic and social repercussions.[10-12]

Present in 8,30 % of adults in Latin America and the Caribbean, HTN in Cuba reaches an estimated prevalence of around 2 million hypertensive patients, with Pinar del Río being the sixth province with the highest prevalence rate until 2020 (241,9 per thousand inhabitants, and higher than the 230.2 national average).[13, 14] Taking into account the aforementioned, the need to carry out this research arises, which aimed to determine the factors that influence the control of blood pressure in hypertensive patients belonging to medical office 59, of the Luis Augusto Turcios Lima University Teaching Polyclinic, from September 2021 to June 2023.

METHODS

An observational, analytical, cross-sectional study was developed in hypertensive patients, belonging to Doctor's Office 59, corresponding to the health area of the Luis Augusto Turcios Lima University Teaching Polyclinic, between July 2021 and May 2023.

The universe was made up of 256 patients over 18 years of age, classified as hypertensive, belonging to said clinic. We worked with a simple random probabilistic sample, made up of those individuals who

met the inclusion criteria (patient over 18 years of age, classified as hypertensive, who agrees to participate in the study, expressing this through informed consent) and exclusion (patient with dementia or cognitive impairment, or who has a terminal illness).

To collect information that gave output to the variables studied, documentary analysis of the Individual Medical Records and Family Health Histories was used, which was complemented with the application of instruments that allowed obtaining the information that gave output to the variables studied (blood pressure control, age, sex, marital status, cohabitation, skin color, education, stress level, anxiety, presence of risk factors [smoking, alcoholism, sedentary lifestyle or inappropriate dietary habits], time with the diagnosis of the disease, presence of polypharmacy, presence of diabetes mellitus, adherence to pharmacological treatment).

Any patient who in the last six months had had BP values less than 140/90 mmHg in people with low or moderate cardiovascular risk was considered controlled; or less than 130/80 mmHg in those with high cardiovascular risk or diabetes mellitus. To measure BP, the auscultatory method was used using a mercury sphygmomanometer.

Among the different psychological evaluation tests applied, there was the Scale to assess the level of stress,[15] it consists of several items which adopt scores between 0 and 1 depending on their presence, which allows a total sum. to classify the patient's stress level, from which the categories are obtained: normal (0-2 points), has passed the limit (3-6 points), excessive stress (7-14 points). At the same time, the State-Trait Anxiety Inventory (IDARE) was applied,[16] of a self-assessment nature, which measures two relatively independent forms of anxiety: anxiety as a state (transient emotional condition) and anxiety as a trait (anxious propensity). relatively stable). Each of them has 20 items (between negative and positive), varying the response form between 0 and 4 for each subscale. For state anxiety there are 10 positive items and an equal number of negative ones, so that by subtracting the score of the positive ones from the negative ones, a cumulative score is obtained to be evaluated to determine state anxiety. On the other hand, the trait scale has 13 positive items and 7 negative items, also obtaining a cumulative value after subtracting the value of the positive items from that of the negative items. Both modalities can be evaluated at High (≥ 45 points), Medium (30-44 points) and Low (< 30 points).

The Martín-Bayarre-Grau (MBG) questionnaire was applied,[17] which made it possible to determine the degree of therapeutic adherence according to the patient's frequency of carrying out certain activities associated with pharmacological treatment. Its qualification was established from the estimation of a score, classifying adherence as: total adherence (38-48 points), partial adherence (18-37 points) and non-adherence (0-17 points).

Statistical processing

Data processing was carried out using the SPSS statistical package in version 22 for Windows, using descriptive and inferential statistics methods for information processing. Initially, the Kolmogorov-Smirnov test was used to verify compliance with the assumption of normality in the quantitative variables of the research, and thereby define the use of parametric or non-parametric tests. As descriptive statistics methods, measures of central tendency (arithmetic mean or median) and dispersion (standard deviation or interquartile ranges) were analyzed, in the case of quantitative variables; as well as the absolute frequencies and percentages, to represent the univariate behavior of the categorical variables.

For the bivariate analysis, inferential statistics were used, using Pearson's X2 tests for categorical variables. In seeking to establish possible interactions between categorical and quantitative variables, the Student's t-test for unrelated samples and the Mann-Whitney U test were used, depending on compliance with the assumption of normality. Values of $p<0.05$ were taken; as statistical evidence of the differences found. In addition, the calculation of the percentage change was used to evaluate the changes before and after the educational intervention. The results were presented through tables and graphs.

Ethical parameters

For the execution of the study, the aspects reflected in the Declaration of Helsinki were taken into consideration regarding the design and application of research in humans, thus complying with the principle of autonomy established in the International Code of Bioethics for research in humans. humans. The Ethics Committee of the institution was consulted to carry out the study, the confidentiality of the information was guaranteed, each patient was informed in detail of the objectives and characteristics of the study and they were asked in writing for informed consent to participate in it.
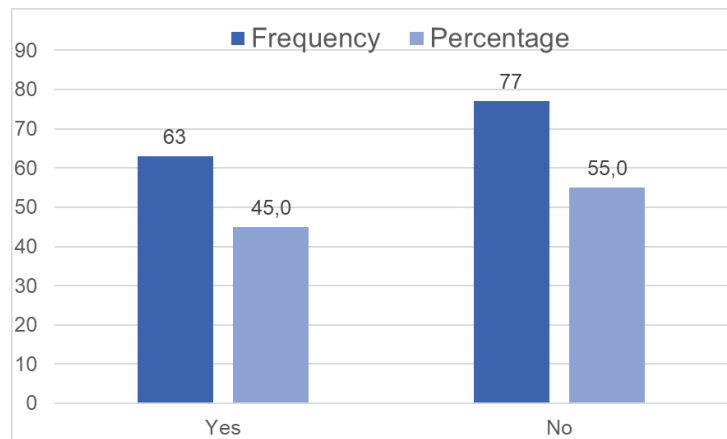
RESULTS

Figure 1. Distribution of the sample according to blood pressure control. Medical Office 59. Luis Augusto Turcios Lima University Teaching Polyclinic. 2021-2023

In the analyzed sample (Figure 1), a predominance of hypertensive patients who did not have BP control (55,0 %) was observed.

Table 1. Demographic profile according to blood pressure control					
Variable		**Control of blood pressure**		**Total**	**p value**
		Yes	**No**		
		Frequency (%)	**Frequency (%)**	**Frequency (%)**	
Sex*	Female	49 (49,5)	50 (50,5)	99 (70,7)	0,097
	Male	14 (34,1)	27 (65,9)	41 (29,3)	
Age [Mean(SD)]**		64,8 (10,7)	44,5 (12,4)	53,7 (15,4)	<0,001
Skin color*	White	18 (48,6)	19 (51,4)	37 (26,4)	0,516
	Half Blood	15 (51,7)	14 (48,3)	29 (20,7)	
	Black	30 (40,5)	44 (59,5)	74 (52,9)	
Marital status*	Single	45 (57,0)	34 (43,0)	79 (56,4)	0,202
	Married/Consensual Union	14 (36,8)	24 (63,2)	38 (27,1)	
	Widowed/divorced	4 (17,4)	19 (82,6)	23 (16,4)	
Scholarship*	Primary	14 (45,2)	17 (54,8)	31 (22,1)	0,415
	Secondary	15 (37,5)	25 (62,5)	40 (28,6)	
	Pre-university	25 (54,3)	21 (45,7)	46 (32,9)	
	University	9 (39,1)	14 (60,9)	23 (16,4)	
Coexistence*	Alone	1 (5,3)	18 (94,7)	19 (13,6)	<0,001
	Accompanied	62 (51,2)	59 (48,8)	121 (86,4)	
Notes: * Pearson's X2 test; **Student t-test for unrelated simples					

Table 1 shows the demographic profile of the individuals included in the study, detailing a predominance of female sex (70,7 %), with an average age of 53,7±15,4 years, and skin color being black. the most representative (52,9 %). 56,4 % of the participants were single, 32,9 % had a pre-university educational level, and 86,4 % lived with someone. Age (p<0,001) and cohabitation (p<0.001) were the only variables that showed a statistically significant association with BP control, with the mean age of patients with BP control being greater than that of those without. they had it (64,8±10,7 vs. 44,5±12,4). For their part, among hypertensives who live with someone, 51,2 % showed control, while among those who live alone, 5,3 % were controlled.

Table 2. Psychosocial characteristics according to blood pressure control					
Variable		Control of blood pressure		Total	p value
		Yes	No		
		Frequency (%)	Frequency (%)	Frequency (%)	
Stress level*	Normal	31 (100)	0 (0)	31 (22,1)	<0,001
	Has passed the limit	30 (37,0)	51 (63,0)	81 (57,9)	
	Excessive stress	2 (10,0)	18 (90,0)	20 (14,3)	
	Too much stress	0 (0)	8 (100)	8 (5,7)	
State anxiety***	Low	54 (93,1)	4 (6,9)	58 (41,4)	<0,001
	Half	9 (12,3)	64 (87,7)	73 (52,1)	
	High	0 (0)	9 (100)	9 (6,4)	
Trait anxiety***	Low	56 (93,3)	4 (6,7)	60 (42,9)	<0,001
	Half	7 (9,6)	66 (90,4)	73 (52,1)	
	High	0 (0)	7 (100)	7 (5,0)	
Notes: * Mann Whitney U test; **Pearson's X2 test; ***Student t-test for unrelated simples					

The analysis of the psychosocial characteristics (Table 2) in the sample made it possible to specify how 57,9 % of the patients showed stress levels that had exceeded the limit. In turn, average levels of trait and state anxiety were detailed (52,1 % in both cases). When relating these variables to BP control, all patients with normal levels of stress had BP control, with a higher percentage of control among those who showed low levels of anxiety. Both the level of stress, as well as trait and state anxiety, showed a statistically significant association with BP control (p<0,05).

Table 3. Presence of risk factors according to blood pressure control					
Variable		Control of blood pressure		Total	p value
		Yes	No		
		Frequency (%)	Frequency (%)	Frequency (%)	
Smoking	Yes	13 (31,7)	28 (68,3)	41 (29,3)	0,042
	No	50 (50,5)	49 (49,5)	99 (70,7)	
Alcoholism	Yes	0 (0)	6 (100)	6 (4,3)	0,024
	No	63 (47,0)	71 (53,0)	134 (95,7)	
Sedentary lifestyle	Yes	4 (9,8)	37 (90,2)	41 (29,3)	<0,001
	No	59 (59,6)	40 (40,4)	99 (70,7)	
Inappropriate dietary habits	Yes	13 (30,2)	30 (69,8)	43 (30,7)	0,019
	No	50 (51,5)	47 (48,5)	97 (69,3)	
Notes: *Pearson's X2 testTexto					

Table 3 shows the presence of smoking and alcoholism in 29.3 and 4,3 % of the patients studied. A sedentary lifestyle was present in 29,3 % of the participants, and inadequate dietary habits in 30,7 %. All variables related to lifestyle were associated with BP control (p<0,05).

There was a median of 10 (IQR: 3-13) years with the diagnosis of the disease, with 37,9 % of the sample showing polypharmacy. The existence of statistically significant differences between patients with and without BP control is detailed, in terms of time since the diagnosis of the disease (p=0,004).
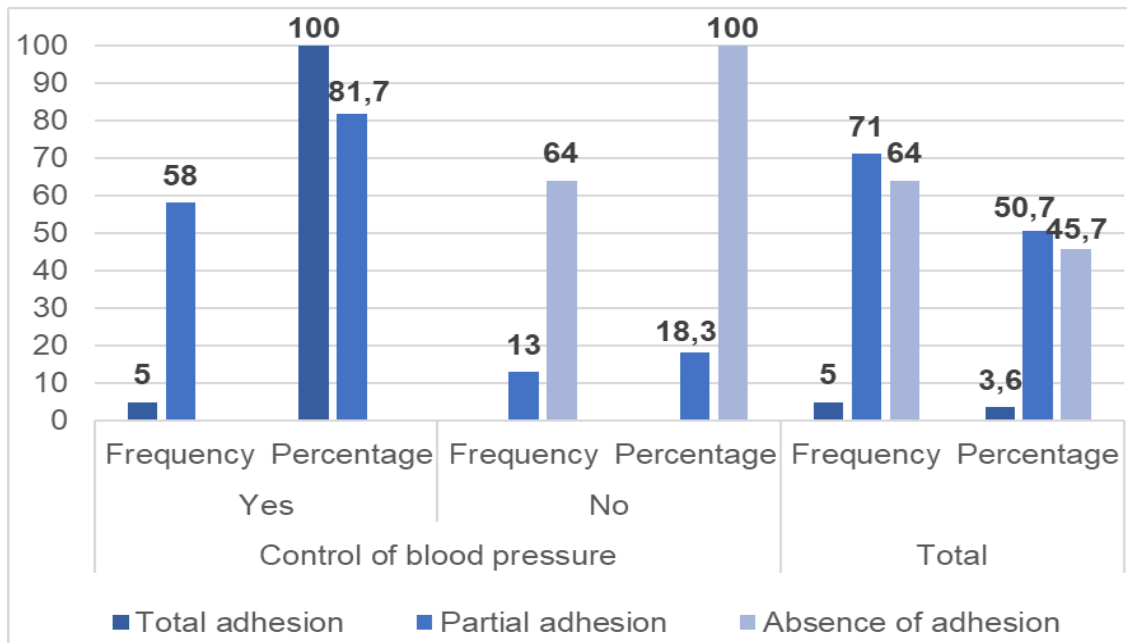

Figure 2. Control of blood pressure according to adherence to pharmacological treatment Mann Whitney U test (p<0.001)

Figure 2 details the predominance of patients with partial adherence (50,7 %) and absence of adherence (45,7 %). A relationship was found between both variables (p<0,001), with all patients showing complete adherence and BP control. Meanwhile, 81,5 % of those with partial adherence managed to achieve BP control, while those without adherence did not achieve said control.

DISCUSSION

The PURE prospective urban rural epidemiological study, which involved urban and rural communities in 17 high, middle and low income countries, with a total of 142,042 participants, demonstrated a global prevalence of HTN of 41 %, of which only 32,5 % were controlled, a result similar to that reported in the present investigation, although the percentage of lack of control was lower.[18]

In a study developed by Chaves Coelho and collaborators,[19] the opposite result was detailed, detailing how 51,1 % of the patients included in their study maintained control over their BP figures. In relation to this, the prevalence of control in the best possible scenarios is only reasonable. Recent data showed poor screening rates in twelve high-income countries: Finland, Ireland, Italy, Japan and Spain had lower rates (<20 % in some age groups and sexes), while Canada and Germany had the highest (50-58 % among women and 48-69 % among men, respectively).[20] Compared with these results, the data from the present study stand out positively, although there remains an important gap in regarding the effective treatment of hypertension.

Similarly, in a systematic review where a total of 33 studies were included, the prevalence of hypertension control in studies from low- and middle-income countries ranged between 3,8-50,4 %, and in high-income countries ranged between 36,3 % and 69,6 %.[21] In relation to the national context, the results coincide with national authors, detailing BP control rates that range between 30-65 %.[22,23]

Recent research in hypertensive patients shows that the prevalence of hypertensive disease increases with age, being more common after 60 years of age. However, studies that consider groups of working-age workers as a sample offer results similar to this one. with a predominance of the group between 40 and 59 years old. In turn, these studies support the predominance of the age groups found. When establishing the relationship between sociodemographic variables and therapeutic adherence, in terms of age, it is striking that only patients over 60 years of age fully adhere to it, all of this, in turn, has an impact on blood pressure control. [24]

Differences have been shown in terms of skin color, and specifically in terms of race or ethnicity, although it is related to a complex management of HTN control, as it interacts with multiple factors such as access to care; susceptibility to HTN and comorbidities such as diabetes and obesity. The percentages of HTN control by race/ethnicity for non-Hispanic whites, non-Hispanic blacks, and Mexican Americans were 35,4 % (95 % CI: 28,7-42,1), 28,9 % (95 % CI: 22-35,8) and 26,5 % (95 % CI: 16,5-36,5) respectively; being higher for non-Hispanic whites. [25,26]

In the study by Abu-Saady collaborators, [27] it was found that people currently married and those who had previously been married had greater control of HTN OR=2,39 (95 % CI: 1,52-3,74) and OR=1,81 (95 % CI: 1,12-2,93), respectively and taking singles as a reference. Added to this is the existence of evidence showing that marital status and marital breakdown (that is, separation, divorce and widowhood) are associated with poor physical health outcomes and control of NCDs, including HTN. [28]

A relevant piece of information is provided by the level of education, since no scientific reports were found that took this variable into account in hypertensive patients. However, it is known that the low level of education is directly proportional to the appearance of chronic diseases; this is due, among other things, to the lack of knowledge about the risk factors that cause these pathologies. Likewise, people with a low level of education tend to use less effective coping mechanisms for the disease. [29]

For Kalinowski et al., [30] evidence suggests that stress is associated with the incidence of hypertension and the risk of hypertension. Stress management is associated with improvements in BP outcomes. Given this, these authors developed a systematic review to synthesize the evidence on the effects of stress management interventions on BP. In that study, reductions in BP were observed in all meditation-based interventions, although the magnitude and statistical significance varied. Comprehensive lifestyle interventions were also effective in reducing BP, although the relative contribution of stress management versus behavior modification could not be assessed. For their part, coping and affirmation interventions did not affect BP. What has been said shows the need to pay attention to stress as an influential factor in BP control.

Similar results were presented by Liu et al., [31] when they showed in their study how psychosocial stress was associated with a higher risk of hypertension (OR = 2,40, 95 % CI: 1,65-3,49), and patients Hypertensive patients had a higher incidence of psychosocial stress compared to normotensive patients (OR = 2,69, 95 % CI: 2,32-3,11).

In relation to anxiety, the levels presented in the present research agree with what was reported by Mushtaq, [32] where trait and state anxiety had average levels of 45,8 and 53,1 % respectively. They, according to the authors of the aforementioned study, affect the appearance and decompensation of cardiovascular diseases.

Factors such as a sedentary lifestyle, obesity, inadequate eating habits and toxic habits favor the development and progression of HTN. The scientific community identifies them as modifiable factors related to unhealthy lifestyles. For this reason, it is important to emphasize the implementation of health promotion and prevention measures focused on changes in lifestyles that favor the development of cardiovascular diseases. [33] In this sense, the international report Global report on hypertension: the race against a silent killer, indicates how in Cuba BP control rates are slightly reduced, in part, due to the confluence of risk factors such as smoking (present in 42,7 % of hypertensive patients), sedentary lifestyle (51,7 %), and bad eating habits (48,2 %). (46)

The study conducted by Gort-Hernández et al.,[34] indicates that 45,3 % of its participants were sedentary, and 17,5 % smoked, showing some similarities, although the percentages in the case of sedentary lifestyle are somewhat higher in your study. Given this, introducing lifestyle changes, for example, adopting a healthier diet, quitting smoking and practicing more physical activity, can help reduce blood pressure. Some people may need medications to effectively control HBP and prevent related complications.[35]

Regarding the presence of smoking, according to international reports, 32,5 % of the world population is an active smoker, with the percentage increasing to 47,8 % in the case of hypertensive patients, which makes it difficult to control this disease.[36,37] Diet modification is one of the pillars of HTN treatment. Current US and European guidelines recommend that people eat fruits, vegetables, whole grains and low-fat dairy products, as well as reduce their consumption of red meat, sugar and trans fats. Research has shown that the Dietary Approach to Stop Hypertension (DASH) diet can lower BP as effectively or even more significantly than some antihypertensive drugs. The Mediterranean diet also leads to a considerable reduction in BP. Vegans and vegetarians have been shown to have a lower prevalence of HA than omnivores. Caloric restriction can decrease BP in normotensive, prehypertensive, and hypertensive populations.[38]

In their study, Coelho et al.,[19] report a lower mean than that presented in the present investigation in terms of the time with the diagnosis of the disease (5,73 ± 2,72 years). These authors in turn recognize the relationship between said time and the presence of disease control.

In Brazil, Pinhati et al.,[39] detail how 57,1 % of patients did not have pharmacological adherence, posing a serious problem, given the implications that non-strict compliance with pharmacological treatment entails on the control of the figures of PA. This low total adherence reported in the present investigation would undoubtedly be associated with a low level of knowledge about the disease, a phenomenon also reported by Aguado-Fabián,[40] and Herrera-Añazco P.[41]

Poulter et al.[42] in their research detail a statistically significant relationship between pharmacological adherence and BP control (p=0,032), detailing a predominance in the cases analyzed of patients without pharmacological adherence (53,8 %).

In relation to what has been reported, the global hypertension epidemic is largely uncontrolled, due to suboptimal levels of adherence, which includes not initiating pharmacotherapy, not taking medications with the prescribed frequency, and persisting in long-term therapy. This element is a well-recognized factor contributing to poor BP control in hypertension. Several categories of factors, including demographic factors, socioeconomic factors, comorbid medical-behavioral conditions, therapy-related factors, health care team and system-related factors, and patient factors, are associated with nonadherence, so understanding them contributes to the management of lack of adherence.[43]

CONCLUSIONS

The study made it possible to identify a predominance of those patients who did not have blood pressure control, with the demographic variables, age and cohabitation being the only ones that showed a statistically significant association with blood pressure control. Among the psychosocial variables, this association was specified by the level of stress and anxiety levels. All risk factors were associated with the absence of BP control, as was the time since the diagnosis of the disease was close to ten years. The association between pharmacological adherence and BP control was also detailed.

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CONFLICT OF INTEREST
The authors declare that there is no conflict of interest.

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