Revista Cubana de Medicina Militar

2025;54(2):e025076018

Research Article

Impact of epidemiological and psychosocial factors on blood pressure control

Impacto de los factores epidemiológicos y psicosociales en el control de la presión arterial

Lázaro Pablo Linares Cánovas[1]* https://orcid.org/0000-0002-1597-9202

Guillermo Luís Herrera Miranda[2] https://orcid.org/0000-0002-5366-3030

Liyansis Bárbara Linares Cánovas[3] https://orcid.org/0000-0001-9802-7292

Rubén Dario Lemus Ramos[4] https://orcid.org/0009-0001-8512-8884

Adalina Linares Montano[1] https://orcid.org/0009-0001-2005-6090

Wiliam Ismel Sánchez Muñoz[5] https://orcid.org/0009-0006-1426-2425

Geovani López Ortiz[6] https://orcid.org/0000-0003-0280-0012

[1]Policlínico Docente Universitario "Luis Augusto Turcios Lima". Pinar del Río, Cuba.

[2]Universidad de Ciencias Médicas de Pinar del Río. Pinar del Río, Cuba.

[3]Policlínico Universitario "Modesto Gómez Rubio". Pinar del Río, Cuba.

[4]Hospital General Docente "Abel Santamaría Cuadrado". Pinar del Río, Cuba.

[5]Policlínico Docente "Raúl Sánchez". Pinar del Río, Cuba.

[6]Universidad Nacional Autónoma de México. Facultad de Medicina. Ciudad de México, México.

*Autor para correspondencia. Correo electrónico: ashirogi.science@gmail.com

ABSTRACT

Introduction: The lack of blood pressure control motivates an adequate study of related epidemiological and psychosocial characteristics.

Objective: To evaluate the influence of epidemiological and psychosocial characteristics on blood pressure control in hypertensive patients.


2025;54(2):e025076018

Methods: Observational, analytical, cross-sectional study, developed in 2024, in a sample of 560 hypertensive patients. The review of medical records and the application of instruments allowed obtaining information that gave way to the variables studied. Descriptive and inferential statistics methods were applied, which made it possible to establish the association between the independent variables and blood pressure control. Medical ethics were respected.

Results: 55% of patients had uncontrolled blood pressure, with a predominance of females (70.7%), and an average age of 53.7 ± 15.4 years. These variables, along with marital status, education, and cohabitation, were associated with blood pressure control ($p< 0.05$); 22.1% of patients had normal stress levels, while medium levels of trait and state anxiety predominated (52.1% in both cases), which were also associated with blood pressure control ($p< 0.0001$).

Conclusions: The identified epidemiological and psychosocial characteristics were shown to be associated with the lack of blood pressure control. This will enable future studies to use these findings as a basis for crafting strategies aimed at reducing the prevalence of uncontrolled hypertensive patients.

Keywords: blood pressure; disease management; hypertension; medical care.

RESUMEN

Introducción: La falta de control de la presión arterial motiva un adecuado estudio de las características epidemiológicas y psicosociales relacionadas.

Objetivo: Evaluar la influencia de las características epidemiológicas y psicosociales en el control de la presión arterial en pacientes hipertensos.

Métodos: Estudio observacional, analítico, de corte transversal, desarrollado en el año 2024, en una muestra de 560 pacientes hipertensos. La revisión de historias clínicas y la aplicación de instrumentos, permitieron obtener información que dio salida a las variables estudiadas. Se aplicaron métodos de estadística descriptiva e inferencial, lo que permitió establecer la asociación entre las variables independientes y el control de la presión arterial. Se respetó la ética médica.

Resultados: El 55 % de los pacientes no tenían control de la presión arterial, predominando las féminas (70,7 %), con una edad promedio de 53,7 ± 15,4 años. Estas variables, junto al estado civil, educación y convivencia, estuvieron asociadas al control de la presión arterial ($p< 0,05$). El 22,1 % de los pacientes


2025;54(2):e025076018

tuvo niveles normales de estrés, predominaron niveles medios de ansiedad como rasgo y estado (52,1 % en ambos casos), asociados al control de la presión arterial (p< 0,0001).

Conclusiones: Las características epidemiológicas identificadas, así como las psicosociales, mostraron asociación con el descontrol de la presión arterial. Ello permitirá establecer futuros estudios, que las tomen como bases para la confección de estrategias encaminadas a modificar el predominio de pacientes hipertensos sin control de la presión arterial.

Palabras clave: atención médica; hipertensión; manejo de la enfermedad; presión arterial.

Received: 20/11/2024

Approved: 09/04/2025

INTRODUCTION

Non-communicable diseases (NCDs) pose a global threat due to their high prevalence. Cardiovascular diseases (CVD), including high blood pressure (HBP), are among the most significant public health challenges. HBP affects over 1.28 billion people worldwide,[1,2,3] and is responsible for 10.8 million annual deaths. It is also one of the leading causes of disability and premature mortality, with substantial personal, economic, and health impacts.[4,5,6]

In this context, the need for blood pressure control (BPC) is a fundamental pillar to reduce the morbidity and mortality associated with these diseases. However, achieving this goal remains a current challenge. It is estimated that less than half of diagnosed and treated patients (only 33%) achieve adequate BPC levels, which leads to problems for the individual, their family, and society.[7,8]

In this context, the comprehensive BPC has a strong sociocultural component. It consists of psychosocial factors linked to patient behaviors, practices, and social determinants of health. These elements intertwine with treatment to shape health outcomes.[9] Recently, health personnel have focused on psychosocial characteristics to assess their influence on the genesis and progression of this disease.[10,11]


2025;54(2):e025076018

Understanding the psychosocial roots of health problems aids in crafting effective strategies and policies. Most studies highlight the influence of social and psychological indicators on hypertension through their effects on lifestyle practices. However, the relationship between psychosocial status and disease control remains underexplored.[12,13,14] Growing research links psychosocial factors to BPC, emphasizing the need to identify psychosocial profiles in these patients.[15] In accordance with the situation addressed, the present research was required, which aimed to evaluate the influence of epidemiological and psychosocial characteristics on BPC in hypertensive patients.

METHODS

Design

An observational, analytical, cross-sectional study was conducted in hypertensive patients belonging to the Capitán San Luis People's Council, part of the health area of the Luis Augusto Turcios Lima University Teaching Polyclinic, in the Pinar del Río municipality, in 2024.

Subjects

From a universe consisting of 3,286 patients, over 19 years of age, classified as hypertensive; a sample of 560 patients was selected through simple random probabilistic sampling, once compliance with the inclusion criteria (patient over 19 years of age, classified as hypertensive, who agrees to participate in the study, expressing this through informed consent), and exclusion (patient with dementia, cognitive impairment, or terminal diseases) was verified.

With the application of the formula $n= Z^2*(p)*(1-p)/c^2$ (where Z= 99% confidence level; c= 5% margin of error; p= 0.5), determined the need for a minimum sample size of 555 patients. A simple random probabilistic sampling method was used to select 560 patients.

Variables and procedures

To collect information that led to the variables studied (age, sex, skin color, marital status, education, cohabitation, blood pressure control, stress level, perceived social support, anxiety level) the analysis of individual clinical histories was used, which was complemented with the application of instruments.


2025;54(2):e025076018

The criteria for BPC of HTA were established as those accepted at international level,[16,17] being classified as "controlled" a patient who in the last 6 months had BP values less than 140/90 mmHg in people with low or moderate cardiovascular risk; or less than 130/80 mmHg in those with high cardiovascular risk, or with diabetes mellitus. To measure BP the auscultatory method was used using a mercury sphygmomanometer.

The perceived social support variable was studied using the Social Support Questionnaire (CAS-7),[18] which, through 7 statements, allowed determining the behavior of each of the 4 dimensions that make up the variable (instrumental, informational, emotional and social support), assessing the support of each dimension as adequate or inadequate. Other test applied, was the Scale to assess the level of stress, which consists of 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), the limit has been exceeded (3-6 points), excessive stress (7-10 points) or too much stress (11-14 points).[19]

For the evaluation of anxiety levels, the State-Trait Anxiety Inventory (IDARE) was applied, which measures two relatively independent forms of anxiety: state (transient emotional condition) and trait (relatively stable anxious tendency). Each of them has 20 items (between negative and positive), with the response form varying between 0 and 4 for each subscale. Both modalities can be evaluated at High (≥ 45 points), Medium (30-44 points) and Low (< 30 points) levels.[20]

Processing

The data was processed using the SPSS statistical package, version 22 for Windows, employing descriptive and inferential statistical methods for data analysis. Absolute frequencies and percentages were evaluated as descriptive statistical methods. Among the inferential statistical methods, Pearson's X^2 test (used to analyze the association between categorical variables), the t-Student test for unrelated samples (to compare the means of two independent groups), and the Mann-Whitney U test (a non-parametric test used when the data did not meet the normality assumptions required for the t-Student test) were applied. Values of $p< 0.05$ were considered as statistical evidence of the differences found. The results were presented through tables and graphs.

2025;54(2):e025076018

Bioethical Issues

The aspects reflected in the Declaration of Helsinki regarding the design and application of research on humans were taken into consideration in the execution of the study, thus complying with the principle of autonomy established in the International Code of Bioethics for research on humans. The Ethics Committee of the institution was consulted for the conduct of 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 for written informed consent to participate in it.

RESULTS

In the sample analyzed (Fig. 1), a predominance of hypertensive patients who did not have BPC (55.0%) was observed.

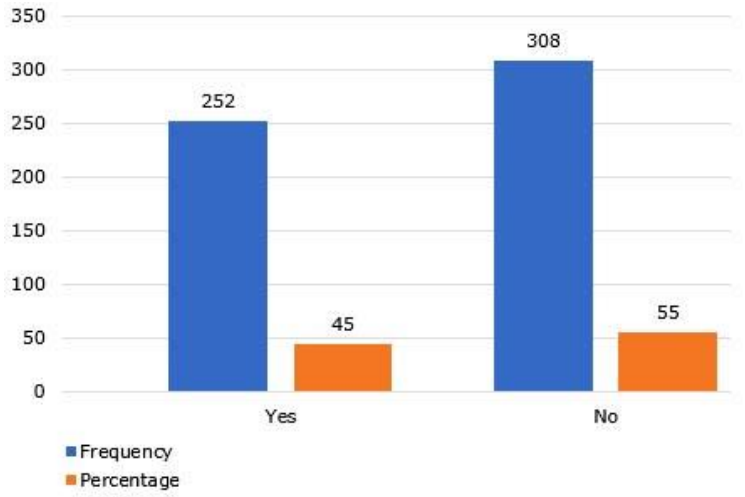

Fig. 1 - Sample distribution according to blood pressure control.

The epidemiological profile of the individuals included in the study is shown in table 1, detailing a predominance of females (70.7%), with an average age of 53.7 ± 15.4 years, and black skin being the most representative (52.9%). 56.4% of the participants were married/consensual union, 32.9% had a pre-

university or technical secondary education level, and 86.4% lived with someone. Sex (p= 0.0009), age (p< 0.0001), marital status (p< 0.0001), education (p= 0.0096) and cohabitation (p< 0.001) were the variables that showed a statistically significant association with BP control, with the average age of patients with BP control being higher than that of those without (64.8 ± 10.7 *versus* 44.5 ± 12.4). Among hypertensive patients who live with someone, 51.2% showed control, while among those who live alone, 5.3% were under control.

Table 1 - Epidemiological profile according to blood pressure control

Variables		Blood Pressure Control		Total	p Value
		Yes	No		
		n (%)	n (%)	n (%)	
Sex	Female	196 (49.5)	200 (50.5)	396 (70.7)	0,0009€
	Male	56 (34.1)	108 (65.9)	164 (29.3)	
Age		64.8 (10.7)	44.5 (12.4)	53,7 (15.4)	< 0.0001£, ɳ
Skin color	White	72 (48.6)	76 (51.4)	148 (26.4)	0,0709€
	Mixed race	60 (51.7)	56 (48.3)	116 (20.7)	
	Black	120 (40.5)	176 (59.5)	296 (52.9)	
Marital status	Married/ Consensual Union	180 (57.0)	136 (43.0)	316 (56.4)	< 0.0001€
	Single	56 (36.8)	96 (63.2)	152 (27.1)	
	Widowed/ divorced	16 (17.4)	76 (82.6)	92 (16.4)	
Education	Primary	56 (45.2)	68 (54.8)	124 (22.1)	0,0096€
	Secondary	60 (37.5)	100 (62.5)	160 (28.6)	
	Pre-university/ Technical secondary education	100 (54.3)	84 (45.7)	184 (32.9)	
	University	36 (39.1)	56 (60.9)	92 (16.4)	
Cohabitation	Alone	4 (5.3)	72 (94.7)	76 (13.6)	< 0.0001€
	Accompanied	248 (51.2)	236 (48.8)	484 (86.4)	

Notes: € (Pearson X^2 test); £ (Mean ± Standard deviation); ɳ (Student's t-test for unrelated samples).

Table 2 shows a predominance of patients with stress levels exceeding the limit (57.9%), while only 22.1% displayed normal levels. The lack of control was associated with higher stress levels (p< 0.0001). Among the evaluated dimensions of perceived social support, affective support was the only one that had a significant relationship with BPC (p< 0.0001). A very significant statistical association was identified

between anxiety levels and BPC (p< 0.0001), with higher percentages of patients without control among those with high levels of trait and state anxiety (100%).

Table 3 - Blood pressure control according to stress level, perceived social support and anxiety

Perceived social support (Dimensions)		Blood Pressure Control		Total	p Value
		Yes	No		
		n (%)	n (%)	n (%)	
Stress level	Normal	124 (100)	- (0)	124 (22.1)	<0.0001*
	The limit has been exceeded	120 (37.0)	204 (63.0)	324 (57.9)	
	Excessive stress	8 (10)	72 (90)	80 (14.3)	
	Too much stress	- (0)	32 (100)	32 (5.7)	
Emotional support	Adequate	220 (48.2)	236 (51.8)	456 (81.4)	0.1062**
	Inadequate	32 (30.8)	72 (69.2)	104 (18.6)	
Instrumental support	Adequate	176 (46.8)	200 (53.2)	376 (67.1)	0.5394**
	Inadequate	76 (41.3)	108 (58.7)	184 (32.9)	
Social interaction	Adequate	244 (46.6)	280 (53.4)	524 (93.6)	0.1564**
	Inadequate	8 (22.2)	28 (77.8)	36 (6.4)	
Affective support	Adequate	248 (50)	248 (50)	496 (88.6)	< 0.0001**
	Inadequate	4 (6.3)	60 (93.8)	64 (11.4)	
State anxiety	Low	216 (93.1)	16 (6.9)	232 (41.4)	< 0.0001***
	Medium	36 (12.3)	256 (87.7)	292 (52.1)	
	High	- (0)	36 (100)	36 (6.4)	
Trait anxiety	Low	224 (93.3)	16 (6.7)	240 (42.9)	< 0.0001***
	Medium	28 (9.6)	264 (90.4)	292 (52.1)	
	High	- (0)	28 (100)	28 (5)	

Notes: * Mann-Whitney U test; **Pearson X^2 test; ***Student t-test for unrelated samples.

DISCUSSION

The PURE urban-rural prospective epidemiological study, which involved urban and rural communities in 17 high-, middle- and low-income countries, with 142,042 participants, showed an overall prevalence of hypertension of 41%, of which only 32.5% were controlled. A result similar to that reported in the present study, although the percentage of uncontrolled hypertension was lower.[21] On the other hand, a


2025;54(2):e025076018

study developed by *López RD* et al.[22] showed control rates around 50%, as did the study conducted by *Chaves Coelho* et al.[23]

In relation to this, the prevalence of control in the best possible scenarios is only reasonable. Recent data showed poor results in terms of control rates in 12 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).[24]

In relation to sex, *Revueltas Agüero M* et al.[25] details prevalence rates of the disease, higher in the female sex, especially after age 50, when the hormonal protective effect ceases to take effect. In this work, carried out by the Institute of Hygiene and Epidemiology of Havana, there was a high diagnosis of the disease in women, who go more frequently to medical services. Similarly, in another study developed by the author, the female gender predominated (67.3%).[26]

Some studies show a significant association, women have greater BPC compared to men, although others indicate that there are no significant differences. Thus, the NHANES study indicates that 33.3% of men had BPC (CI 95%: 27.8-38.8), a value similar to the 35.2% shown by women (CI 95%: 26.6-43.8).[27] However, other authors such as *Azizi Z* et al.[28] and *Santosa A* et al.,[29] support that being a man decreased blood pressure control.

Age is one of the non-modifiable risk factors that contributes most to cardiovascular risk. Cuba is located in the Latin American countries with the greatest population aging; health actions must be preventive and timely in this regard. In a study developed by *Baños-Leyva L* et al.[30] the 50-59 age group predominated, representing 55.2% of the sample, followed by the 60-69 age group, representing 19.1%. These results are close to those detailed in the present research.

The increase in age is related to the increase in systolic BP, finding in people over 60 years of age an OR= 27.35 (95% CI: 18.88-39.61), taking as a reference age group between 18 and 39 years. However, age is inversely related to HBP control in people receiving treatment, since in the 18 to 39 age group 25.5% (95% CI: 13.3-37.7) were controlled; in the 40 to 59 age group 63.9% (95% CI: 55.7 to 72.1) and in those over 60 years 50% (95% CI: 45.1-54.9), as reported by *Gu A* et al.[31] Similarly, *Ashman J* et al.[32] detail how the frequency of control by age group was in the 18 to 39 age group, 25.5% (95% CI:


2025;54(2):e025076018

13.3-37.7); in the 40-59 age group, 39.8% (95% CI: 31.4-48.2); and in those over 60 years of age, 36.7% (95% CI: 33-40.4), that is, with increasing age, the BPC increases.

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 blood pressure control, as it interacts with multiple factors such as access to care; susceptibility to hypertension and comorbidities such as diabetes and obesity. The percentages of BPC by race or 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.[33,34]

In the study by *Abu-Saady K* et al.[35] it was found that currently married people [OR= 2.39 (95% CI: 1.52-3.74)] and those who had previously been married [OR= 1.81 (95% CI: 1.12-2.93)], had greater blood pressure control, taking single people as a reference. Added to this is the existence of evidence showing that marital status and marital breakdown (i.e. separation, divorce and widowhood) are associated with poor physical health outcomes and control of NCDs, including hypertension.[36]

A relevant piece of information is provided by the level of education, since no scientific reports were found that considered this variable in hypertensive patients. However, it is reported in the literature that people with a low level of education tend to use less effective coping mechanisms for the disease.[37]

In the current century, stress is invoked as a cause of various diseases; in the case of hypertension, it is a contributing factor to decompensation. For *Kalinowski J* et al.[38] the evidence suggests that stress is associated with the incidence of hypertension and the risk of hypertension. *Liu M* et al.[39] presented a similar result;[39] 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 hypertensive patients had a higher incidence of psychosocial stress compared to normotensive patients (OR= 2.69, 95% CI: 2.32-3.11).

Social support corresponds to an important function of social relationships and refers to the help or exchange of assistance that occurs through interpersonal transactions. It nourishes the individual from his or her closest core, which is the family, although there are also sources of external support, such as friends, the community and other actors.[40] These psychosocial processes influence the health-disease process of individuals and are part of a complex network of socio-structural conditions and psychosocial mechanisms.[41]


2025;54(2):e025076018

For *Xiong S* et al.,[42] social support, especially family support, does not directly affect BP control, but it does act through other variables such as pharmacological adherence, lifestyle modifications, as well as systematic attendance at consultations for disease check-ups, which together lead, and indirectly, to an impact on BP control. For their part, *Thuy L* et al.[43] examined the role of social support characteristics in the control and behaviors of hypertension. Their results showed that an increase in the total network size was associated with a 52% higher probability of uncontrolled hypertension (OR= 1.52; 95% CI: 1.22-1.89).

Regarding anxiety, the levels presented in the present research agree with those reported by *Mushtaq M* et al.[44] where trait and state anxiety had mean levels of 45.8 and 53.1% respectively. In a systematic review developed by *Lim LF* et al.[45] a significant association was found between anxiety levels and hypertension in cross-sectional studies (OR= 1.37, 95% CI: 1.21-1.54) and prospective studies (OR= 1.40, 95% CI: 1.23-1.59).

In a study developed by *Ho AK* et al.[46] after adjustment for demographic variables, patients with anxiety had higher rates of hypertension uncontrolled (RR: 1.22; 1.07–1.39] than patients without the diagnosis. The study conducted by *Wang X* et al.[47] found that hypertension is associated with higher probabilities of depressive and anxiety disorders in middle-aged and older Chinese women. Consequently, patients with anxiety are 48% more likely to exhibit poor blood pressure control.

The study conducted by *Amaike C* et al.[48] revealed a significant association between anxiety and uncontrolled hypertension. Among the participants, 23.1% had anxiety, and notably, 23.4% of patients with uncontrolled hypertension experienced anxiety. This finding highlights the importance of identifying and addressing mental health conditions in hypertensive patients to improve blood pressure control. Other studies have shown similarities in establishing the relationship between the presence of anxiety and the onset and progression of the disease.[49,50]

Among the limitations of this research, its cross-sectional nature stands out, which makes it difficult to demonstrate clearly, causality between some variables and blood pressure control. This aspect could serve as a basis for future research through longitudinal studies. Additionally, pharmacological adherence and the influence of psychosocial characteristics on it were not evaluated, leaving a significant gap in the comprehensive understanding of the subject.

The findings of the study contribute significantly to the current literature by highlighting the predominance of hypertensive patients without blood pressure control. This result underscores the need to design specific interventions based on the identified epidemiological and psychosocial characteristics. The association between factors such as age, cohabitation, and blood pressure control suggests that health programs should focus on personalized strategies involving both the family environment and social support. Furthermore, the relationship between high levels of stress and anxiety with the lack of disease control emphasizes the importance of integrating psychological support and stress management measures into interventions. Lastly, promoting the development of emotional support within patients' social environments is recommended, given its positive impact on blood pressure control. These contributions address previous gaps in the literature and propose new lines of action for future studies and practical interventions.

BIBLIOGRAPHIC REFERENCES

1. Dziedziak J, Zaleska-Żmijewska A, Szaflik JP, Cudnoch-Jędrzejewska A. Impact of Arterial Hypertension on the Eye: A Review of the Pathogenesis, Diagnostic Methods, and Treatment of Hypertensive Retinopathy [Internet]. Med Sci Monit. 2022; 28: e935135. DOI: 10.12659/MSM.935135

2. World Health Organization. Global report on hypertension: the race against a silent killer [Internet]. Geneva, Switzerland; 2023. [acceso: 13/02/2025]. Disponible en: https://iris.who.int/bitstream/handle/10665/372896/9789240081062-eng.pdf?sequence=1

3. Kario K, Okura A, Hoshide S. The WHO Global report 2023 on hypertension warning the emerging hypertension burden in globe and its treatment strategy [Internet]. Hypertens Res. 2024; 47: 1099-1102. DOI: 10.1038/s41440-024-01622-w

4. Unger T, Borghi C, Charchar F, Khan N, Poulter N, Prabhakaran D, et al. 2020 International Society of Hypertension Global Hypertension Practice Guidelines [Internet]. Hypertension. 2020; 75: 1334-1357. DOI: 10.1161/hypertensionaha.120.15026

5. Adeoye A, Adebiyi A, Adebayo O, Owolabi M. Medication adherence and 24-h blood pressure in apparently uncontrolled hypertensive Nigerian patients [Internet]. Nigerian Postgrad Med J. 2019

[acceso: 13/02/2025]; 26(1): 18-24. Disponible en: https://journals.lww.com/npmj/fulltext/2019/26010/Medication_Adherence_and_24_h_Blood_Pressure_in.4.aspx

6. Yu S, Zhang Y. Improving patient adherence: the last obstacle to achieving hypertension control. Roles of socioeconomic factors and primary care medicine [Internet]. Hypertens Res. 2021 Jun; 44(6):725-726. DOI: 10.1038/s41440-021-00644-y

7. Asenjo Alarcón J. Polifarmacia en pacientes con diabetes tipo 2 e hipertensión arterial atendidos en un hospital provincial [Internet]. Finlay. 2022 [acceso: 13/02/2025]; 12(4): 417-423. Disponible en: http://scielo.sld.cu/scielo.php?pid=S2221-24342022000400417&script=sci_arttext

8. Regino-Ruenes Y, Quintero-Velásquez M, Saldarriaga-Franco J. La hipertensión arterial no controlada y sus factores asociados en un programa de hipertensión [Internet]. Rev. Colomb. Cardiol. 2021 [acceso: 13/02/2025]; 28(6): 648-655. Disponible en: http://www.scielo.org.co/scielo.php?pid=S0120-56332021000600648&script=sci_arttext

9. Veliz Rojas L, Mendoza Parra S, Barriga O. Factores que influyen en el control integral de las enfermedades cardiovasculares [Internet]. Benessere. 2018 [acceso: 13/02/2025]; 2(1):8-20. Disponible en: https://iace.uv.cl/index.php/Benessere/article/view/1325/0

10. Kalinowski J, Kaur K, Newsome-Garcia V, Langford A, Kalejaiye A, Vieira D, et al. Stress interventions and hypertension in Black women [Internet]. Womens Health (Lond). 2021; (17): 17455065211009751. DOI: 10.1177/17455065211009751

11. Foguet-Boreu Q, Ayerbe García-Morzon L. Estrés psicosocial, hipertensión arterial y riesgo cardiovascular [Internet]. Hipertens Riesgo Vasc. 2021 [acceso: 13/02/2025]; 38(2): 83-90. Disponible en: https://www.sciencedirect.com/science/article/pii/S1889183720300866

12. Cuffee Y, Ogedegbe C, Williams NJ, Ogedegbe G, Schoenthaler A. Psychosocial risk factors for hypertension: an update of the literature [Internet]. Curr Hypertens Rep. 2014; 16(10):483. DOI: 10.1007/s11906-014-0483-3

13. Matei Ș, Cutler SJ, Preda M, Dorobanțu M, Ilinca C, Gheorghe-Fronea O, et al. The Relationship Between Psychosocial Status and Hypertensive Condition [Internet]. Curr Hypertens Rep. 2018; 20(12):102. DOI: 10.1007/s11906-018-0902-y

14. Cuevas AG, Williams DR, Albert MA. Psychosocial Factors and Hypertension: A Review of the Literature [Internet]. Cardiol Clin. 2017; 35(2):223-30. DOI: 10.1016/j.ccl.2016.12.004

15. Chirinos DA, Vargas EA, Kershaw KN, Wong M, Everson-Rose SA. Psychosocial profiles and blood pressure control: results from the multi-ethnic study of atherosclerosis (MESA) [Internet]. J Behav Med. 2024; 47(6):1067-79. DOI: 10.1007/s10865-024-00513-2

16. Veliz-Rojas L, Mendoza-Parra S, Barriga A. Adherencia terapéutica y control de los factores de riesgo cardiovasculares en usuarios de atención primaria [Internet]. Enfermería Universitaria. 2015 [acceso: 13/02/2025]; 12(1): 3-11. Disponible en: https://www.scielo.org.mx/scielo.php?pid=S1665-70632015000100002&script=sci_abstract

17. Martínez de Murga García G, Sujo Sit M, Estévez Perera A. Adherencia farmacológica en pacientes hipertensos [Internet]. Rev Cubana Med Gen Integr. 2020 [acceso: 13/02/2025]; 36(1): e982. Disponible en: http://scielo.sld.cu/scielo.php?pid=S0864-21252020000100002&script=sci_arttext&tlng=pt

18. Bernal G, Maldonado-Molina M, Scharrón del Río M. Development of a Brief Scale for Social Support: Reliability and validity in Puerto Rico [Internet]. IJCHP. 2003 [acceso: 13/02/2025]; 3(2): 251-64. Disponible en: https://www.redalyc.org/pdf/337/33730203.pdf

19. López Angulo L, Cabrera Parodis G, Preter Olite M, Luaces Toledo Y, Miranda Chaviano A, Regueira Jacobino B, et al. Compendio de instrumentos de evaluación psicológica [Internet]. La Habana: Editorial Ciencias Médicas; 2010. [acceso: 13/02/2025]. Disponible en: http://www.bvs.sld.cu/libros_texto/compendio_instrumentos/compendio_instrumentos_completo.pdf

20. González Llaneza F. Instrumentos de Evaluación Psicológica [Internet]. La Habana: Editorial Ciencias Médicas; 2007. [acceso: 13/02/2025]. Disponible en: http://newpsi.bvs-psi.org.br/ebooks2010/en/Acervo_files/InstrumentosEvaluacionPsicologica.pdf

21. Chow CK, Yusuf R, Kelishadi R. Prevalence, awareness, treatment, and control of hypertension in rural and urban communities in high-, middle-, and low-income countries [Internet]. JAMA. 2019 [acceso: 13/02/2025]; 311(4):959-68. Disponible en: https://jamanetwork.com/journals/jama/article-abstract/1734702

22. López RD, Barroso WKS, Brandao AA, Barbosa ECD, Malachias MVB, Gomes MM, et al. The first Brazilian registry of hypertension [Internet]. Am Heart J. 2019 Nov [acceso: 13/02/2025]; 205: 154-157. Disponible en: https://pubmed.ncbi.nlm.nih.gov/30268352/

23. Chaves Coelho J, da Luz Pádua Guimarães M, Campos C, Florido C, Viera da Silva G, Pierin A. Blood pressure control of hypertensive patients followed in a high complexity clinic and associated variables [Internet]. J Bras Nefrol. 2021 [acceso: 13/02/2025]; 43(2): 207-16. Disponible en: https://www.scielo.br/j/jbn/a/CJ9VBKXjgdfJJmHcPVqLWYw/

24. NCD Risk Factor Collaboration. Long-term and recent trends in hypertension awareness, treatment, and control in 12 high-income countries: an analysis of 123 nationally representative surveys [Internet]. Lancet. 2019 [acceso: 13/02/2025]; 394(10199): 639-51. Disponible en: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)31145-6/fulltext

25. Revueltas Agüero M, Molina Esquivel E, Pons Díaz O, Hinojosa M, Venero Fernández S, Benítez Martínez M. Caracterización de la prevalencia de la hipertensión arterial en Cuba en 2019 [Internet]. Revista Cubana de Medicina General Integral. 2021 [acceso: 13/02/2025]; 37(4): e1701. Disponible en: http://scielo.sld.cu/scielo.php?pid=S0864-21252021000400010&script=sci_arttext

26. Revueltas Agüero M, Valdés González Y, Serra Larín S, Barceló Pérez C, Ramírez Sotolongo J, Suárez Medina R. Exploración de la presión arterial en pobladores del área de salud 27 de Noviembre del municipio Marianao [Internet]. Finlay. 2020 [acceso: 13/02/2025]; 10(3): 269-79. Disponible en: http://scielo.sld.cu/scielo.php?pid=S2221-24342020000300269&script=sci_arttext

27. Miao H, Liu Y, Tsai T, Schwartz J, Ji J. Association Between Blood Lead Level and Uncontrolled Hypertension in the US Population (NHANES 1999-2016) [Internet]. J Am Heart Assoc. 2020; 9(13): e015533. DOI: 10.1161/JAHA.119.015533

28. Azizi Z, Alipour P, Raparelli V, Norris C, Pilote L. The role of sex and gender in hypertension [Internet]. J Hum Hypertens. 2023 Ago [acceso: 13/02/2025]; 37(8): 589-95. Disponible en: https://www.nature.com/articles/s41371-022-00789-4

29. Santosa A, Zhang Y, Weinehall L, Zhao G, Wang N, Zhao Q, et al. Gender differences and determinants of prevalence, awareness, treatment and control of hypertension among adults in China

and Sweden [Internet]. BMC Public Health. 2020 [acceso: 13/02/2025]; 20(1): e1763. Disponible en: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-020-09862-4

30. Baños-Leyva L, León-Regal M, Mass-Sosa L, Zamora-Galindo J, Hernández-Quintana J, Colls-Cañizares J. Estimación del riesgo cardiovascular global en hipertensos de la Universidad de Ciencias Médicas de Cienfuegos [Internet]. Finlay. 2023 [acceso: 13/02/2025]; 13(1): 76-94. Disponible en: https://revfinlay.sld.cu/index.php/finlay/article/view/1206

31. Gu A, Yue Y, Argulian E. Age Differences in Treatment and Control of Hypertension in US Physician Offices, 2003-2010: A Serial Cross-sectional Study [Internet]. Am J Med. 2020 [acceso: 13/02/2025]; 129(1): 50-8. Disponible en: https://www.sciencedirect.com/science/article/pii/S0002934315007676

32. Ashman J, Rui P, Schappert S. Age Differences in Visits to Office-based Physicians by Adults With Hypertension: United States, 2013 [Internet]. NCHS Data Brief. 2019 [acceso: 13/02/2025]; (263): [aprox. 10 p.]. Disponible en: https://www.cdc.gov/nchs/products/databriefs/db263.htm

33. Deere B, Ferdinand K. Hypertension and race/ethnicity [Internet]. Curr Opin Cardiol. 2020 [acceso: 13/02/2025]; 35(4): 342-50. Disponible en: https://journals.lww.com/co-cardiology/fulltext/2020/07000/hypertension_and_race_ethnicity.7.aspx

34. Abrahamowicz A, Ebinger J, Whelton S, Commodore-Mensah Y, Yang E. Racial and Ethnic Disparities in Hypertension: Barriers and Opportunities to Improve Blood Pressure Control [Internet]. Curr Cardiol Rep. 2023; 25(1): 17-27. DOI: 10.1007/s11886-022-01826-x

35. Abu-Saad K, Chetrit A, Eilat-Adar S, Alpert G, Atamna A, Gillon-Keren M, et al. Blood pressure level and hypertension awareness and control differ by marital status, sex, and ethnicity: a population-based study [Internet]. Am J Hypertens. 2019 [acceso: 13/02/2025]; 27(12): 1511-20. Disponible en: https://academic.oup.com/ajh/article-abstract/27/12/1511/2743179

36. Manfredini R, De Giorgi A, Tiseo R, Boari B, Cappadona R, Salmi R, et al. Marital Status, Cardiovascular Diseases, and Cardiovascular Risk Factors: A Review of the Evidence [Internet]. J Womens Health (Larchmt). 2019; 26(6): 624-32. DOI: 10.1089/jwh.2016.6103

37. Ayodapo A, Elegbede O, Omosanya O, Monsudi K. Patient Education and Medication Adherence among Hypertensives in a Tertiary Hospital, South Western Nigeria [Internet]. Ethiop J Health Sci.

2020 [acceso: 13/02/2025]; 30(2): 243-50. Disponible en: https://www.ajol.info/index.php/ejhs/article/view/195822

38. Kalinowski J, Kaur K, Newsome-Garcia V, Langford A, Kalejaiye A, Vieira D, et al. Stress interventions and hypertension in Black women [Internet]. Womens Health. 2021; (17): e17455065211009751. DOI: 10.1177/17455065211009751

39. Liu M, Li N, Li W, Khan H. Association between psychosocial stress and hypertension: a systematic review and meta-analysis [Internet]. Neurol Res. 2017; 39(6): 573-580. DOI: 10.1080/01616412.2017.1317904

40. Poblete F, Glasinovic A, Sapag J, Barticevic N, Arenas A, Padilla O. Apoyo social y salud cardiovascular: adaptación de una escala de apoyo social en pacientes hipertensos y diabéticos en la atención primaria chilena [Internet]. Aten Prim. 2015 [acceso: 13/02/2025]; 47(8): 523-31. Disponible en: https://www.sciencedirect.com/science/article/pii/S0212656714003990

41. Shahin W, Kennedy G, Stupans I. The association between social support and medication adherence in patients with hypertension: A systematic review [Internet]. Pharm Pract. 2021 [acceso: 13/02/2025]; 19(2): e2300. Disponible en: https://scielo.isciii.es/scielo.php?pid=S1885-642X2021000200007&script=sci_arttext

42. Xiong S, Peoples N, Østbye T, Olsen M, Zhong X, Wainaina C, et al. Family support and medication adherence among residents with hypertension in informal settlements of Nairobi, Kenya: a mixed-method study [Internet]. J Hum Hypertens. 2023 [acceso: 13/02/2025]; 37(1): 74-79. Disponible en: https://www.nature.com/articles/s41371-022-00656-2

43. Thuy L, Thanh N, Trung L, Tan P, Nam H, Diep P, et al. Blood Pressure Control and Associations with Social Support among Hypertensive Outpatients in a Developing Country [Internet]. Biomed Res Int. 2021 [acceso: 13/02/2025]; 3: 7420985. Disponible en: https://www.hindawi.com/journals/bmri/2021/7420985/

44. Mushtaq M, Najam N. Depression, anxiety, stress and demographic determinants of hypertension disease [Internet]. Pak J Med Sci. 2014 [acceso: 13/02/2025]; 30(6): 1293-98. Disponible en: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4320718/

45. Lim LF, Solmi M, Cortese S. Association between anxiety and hypertension in adults: A systematic review and meta-analysis [Internet]. Neurosci Biobehav Rev. 2021 [acceso: 13/02/2025]; 131:96-119. DOI: 10.1016/j.neubiorev.2021.08.031

46. Ho AK, Thorpe CT, Pandhi N, Palta M, Smith MA, Johnson HM. Association of anxiety and depression with hypertension control: a US multidisciplinary group practice observational study [Internet]. J Hypertens. 2015; 33(11):2215-22. DOI: 10.1097/HJH.0000000000000693

47. Wang X, Gao D, Wang X, Zhang X, Song B. Hypertension, socioeconomic status and depressive and anxiety disorders: a cross-sectional study of middle-aged and older Chinese women [Internet]. BMJ Open. 2023; 13(12):e077598. DOI: 10.1136/bmjopen-2023-077598

48. Amaike C, Salami OF, Bamidele OT, Ojo AM, Otaigbe I, Abiodun O, et al. Association of depression and anxiety with uncontrolled hypertension: A cross-sectional study in Southwest Nigeria [Internet]. Indian J Psychiatry. 2024; 66(2):157-64. DOI: 10.4103/indianjpsychiatry.indianjpsychiatry_751_23

49. Shah RM, Doshi S, Shah S, Patel S, Li A, Diamond JA. Impacts of Anxiety and Depression on Clinical Hypertension in Low-Income US Adults [Internet]. High Blood Press Cardiovasc Prev. 2023; 30(4):337-42. DOI: 10.1007/s40292-023-00584-3

50. Eghbali M, Akbari M, Seify K, Fakhrolmobasheri M, Heidarpour M, Roohafza H, et al. Evaluation of Psychological Distress, Self-Care, and Medication Adherence in Association with Hypertension Control [Internet]. Int J Hypertens. 2022; 2022:7802792. DOI: 10.1155/2022/7802792

Conflict of interest

The authors have no conflicts of interest.

Financial information

The authors declare that they have not received any funding during the conduct of the research.


2025;54(2):e025076018

Authors' contribution

Conceptualization: *Lázaro Pablo Linares Cánovas, Guillermo Luís Herrera Miranda, Geovani López Ortiz.*

Data curation: *Lázaro Pablo Linares Cánovas, Liyansis Bárbara Linares Cánovas, Geovani López Ortiz.*

Formal analysis: Guillermo Luís Herrera Miranda, Liyansis Bárbara Linares Cánovas, Geovani López Ortiz.

Visualization: *Liyansis Bárbara Linares Cánovas, Wiliam Ismel Sánchez Muñoz.*

Research: *Lázaro Pablo Linares Cánovas, Guillermo Luís Herrera Miranda, Wiliam Ismel Sánchez Muñoz, Geovani López Ortiz.*

Methodology: *Lázaro Pablo Linares Cánovas, Guillermo Luís Herrera Miranda, Rubén Dario Lemus Ramos.*

Project management: *Lázaro Pablo Linares Cánovas, Rubén Dario Lemus Ramos, Geovani López Ortiz.*

Writing - original draft: *Lázaro Pablo Linares Cánovas, Guillermo Luís Herrera Miranda, Geovani López Ortiz.*

Writing-proofreading and editing: *Lázaro Pablo Linares Cánovas, Guillermo Luís Herrera Miranda, Liyansis Bárbara Linares Cánovas, Rubén Dario Lemus Ramos, Wiliam Ismel Sánchez Muñoz.*

Data availability

Supplementary file: BD Impact of epidemiological and psychosocial factors on blood pressure control. IBM SPSS v.22. Available from:

https://revmedmilitar.sld.cu/index.php/mil/libraryFiles/downloadPublic/51