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RESEARCH

MODIFIABLE CARDIOVASCULAR RISK FACTORS IN PATIENTS WITH SYSTEMIC ARTERIAL HYPERTENSION

FATORES DE RISCO CARDIOVASCULAR MODIFICÁVEIS EM PACIENTES COM HIPERTENSÃO ARTERIAL SISTÊMICA

FACTORES DE RIESGO CARDIOVASCULAR MODIFICABLES EN PACIENTES CON HIPERTENSIÓN ARTERIAL SISTÉMICA

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ABSTRACT

Objective: to identify the modifiable risk factors of patients with systemic arterial hypertension and to relate them to sociodemographic and clinical characteristics. **Methods:** cross-sectional and correlational study carried out in patients with systemic arterial hypertension. The risk factors analyzed were obesity, excessive salt consumption, physical inactivity, alcohol consumption, smoking, stress and sleep apnea. Obesity was analyzed by body mass index and measurement of waist circumference, salt consumption and physical inactivity by patients' reports, disorders related to alcohol consumption by the Alcohol Use Disorders Identification Test, smoking by patients' reports and Fagerström Questionnaire, stress by the Perceived Stress Scale and sleep apnea by the Berlin Questionnaire. The sociodemographic and clinical variables analyzed were age, sex, race, education, marital status, family income, housing, number of children and cohabitants and professional occupation. **Results:** 106 patients were evaluated; 85 were obese, 73 were sedentary, 71 were at high risk for obstructive sleep apnea and 25 were using alcohol. The average score of disorders due to alcohol was 0.83 ± 2.8 points, salt consumption was 3.95 grams, stress was 14.2 ± 7.6 points and nicotine dependence was 3.00 ± 1.7 points. Obesity, physical inactivity, use of alcohol, salt consumption and stress were related to some sociodemographic variables. **Conclusion:** preventive actions should be taken to change the lifestyle of these patients and, consequently, reduction of complications and other cardiovascular diseases.

Keywords: Hypertension; Risk Factors; Cardiology; Nursing.

RESUMO

Objetivo: *identificar os fatores de riscos modificáveis de pacientes com hipertensão arterial sistêmica e relacioná-los às características sociodemográficas e clínicas.* ***Métodos:*** *estudo transversal e correlacional realizado em pacientes com hipertensão arterial sistêmica. Os fatores de risco analisados foram obesidade, consumo excessivo de sal, sedentarismo, consumo de bebida alcoólica, tabagismo, estresse e apneia do sono. A obesidade foi analisada pelo índice de massa corporal e medida da circunferência abdominal, o consumo de sal e o sedentarismo pelo relato dos pacientes, as desordens relacionadas ao consumo de álcool pelo Alcohol Use Disorders Indentification Test, o tabagismo pelo relato dos pacientes e pelo Questionário de Fagerström, o estresse pela Escala de Estresse Percebido e a apneia do sono pelo Questionário de Berlim. As variáveis sociodemográficas e clínicas analisadas foram idade, sexo, raça, escolaridade, estado civil, renda familiar, moradia, número de filhos e de conviventes e ocupação profissional.* ***Resultados:*** *foram avaliados 106 pacientes; 85 eram obesos, 73 sedentários, 71 apresentavam alto risco para apneia obstrutiva do sono e 25 faziam uso de álcool. A média do escore de desordens devido ao álcool foi de 0,83+2,8 pontos, do consumo de sal foi de 3,95 gramas, do estresse foi de 14,2+7,6 pontos e da dependência de nicotina foi de 3,00+1,7 pontos. Obesidade, sedentarismo, uso de bebida alcoólica, consumo de sal e estresse relacionaram-se a algumas variáveis sociodemográficas.* **Conclusão:** *ações preventivas devem ser adotadas para que haja mudança no estilo de vida desses pacientes e, consequentemente, redução de complicações e de outras doenças cardiovasculares.*

Palavras-chave: *Hipertensão; Fatores de Risco; Cardiologia; Enfermagem.*

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RESUMEN

Objetivo: *identificar los factores de riesgo modificables de pacientes con hipertensión arterial sistémica y relacionarlos con características sociodemográficas y clínicas.* ***Métodos:*** *estudio transversal y correlacional realizado en pacientes con hipertensión arterial sistémica. Los factores de riesgo analizados fueron obesidad, consumo excesivo de sal, inactividad física, consumo de alcohol, tabaquismo, estrés y apnea del sueño. La obesidad se analizó mediante el índice de masa corporal y la medición de la circunferencia de la cintura, el consumo de sal y la inactividad física según los informes de los pacientes, los trastornos relacionados con el consumo de alcohol mediante el test para la identificación de trastornos por uso de alcohol (AUDIT), el tabaquismo según los informes de los pacientes y el cuestionario de Fagerström, estrés por la escala de estrés percibido y apnea del sueño por el cuestionario de Berlín. Las variables sociodemográficas y clínicas analizadas fueron edad, sexo, raza, educación, estado civil, ingresos familiares, vivienda, número de hijos y convivientes y ocupación profesional.* ***Resultados:*** *se evaluaron 106 pacientes; 85 eran obesos, 73 eran sedentarios, 71 tenían un alto riesgo de apnea obstructiva del sueño y 25 usaban alcohol. El puntaje promedio de los trastornos debidos al alcohol fue de 0,83 + 2,8 puntos, el consumo de sal fue de 3,95 gramos, el estrés fue de 14,2 + 7, 6 puntos y la dependencia de la nicotina fue 3,00 + 1,7 puntos. La obesidad, la inactividad física, el uso de alcohol, el consumo de sal y el estrés se relacionaron con algunas variables sociodemográficas.* ***Conclusión:*** *deben tomarse medidas preventivas para cambiar el estilo de vida de estos pacientes y, en consecuencia, reducir las complicaciones y demás enfermedades cardiovasculares.*

Palabras clave*: Hipertensión; Factores de Riesgo; Cardiología; Enfermería.*

INTRODUCTION

Cardiovascular diseases (CVDs) are the main causes of hospitalization and death. In 2016, approximately 17.9 million people died worldwide due to CVDs.[1] Among these diseases there is systemic arterial hypertension (SAH).

SAH is a multifactorial clinical condition that is characterized by persistently high blood pressure (BP) levels. It may be associated with structural and/or functional alterations in the target organs and metabolic changes, which may cause a high risk of fatal and non-fatal cardiovascular events.[2]

It has a high prevalence, low control rates and is one of the most important public health problems.[2] This disease has been increasing in developing countries, as it is, in most cases, asymptomatic and due to the lack of information on its control by population. In Brazil, in 2017, this disease was responsible for 55,891 hospitalizations and, in 2013, for 24,230 deaths.[3]

The high prevalence may be related to the various risk factors associated with this disease, which may be non-modifiable (age, gender and ethnicity) and modifiable (overweight, excess salt and alcohol intake, physical inactivity, smoking, obstructive sleep apnea/ hypopnea and stress). Modifiable risk factors should be investigated in order to find out which of them are most relevant in different populations, enabling interventions to modify the lifestyle of individuals.[2]

Therefore, the objectives of the study were to identify the modifiable cardiovascular risk factors of patients with systemic arterial hypertension treated at the outpatient clinic of a hospital in the city of *São Paulo* and to relate them to sociodemographic and clinical characteristics.

METHODS

This is a cross-sectional and correlational study carried out at the Lipid Ambulatory of a public hospital in the city of *São Paulo*, from August 2016 to December 2017. The sample consisted of individuals with SAH, over 18 years old and without cognitive deficit. The selection of the sample was made by the consecutive sampling strategy, which refers to the inclusion of individuals in the sample as they are on site during the study period and meet the established criteria.[4]

The risk factors assessed were obesity, excessive salt consumption, physical inactivity, use of alcohol, smoking, stress and sleep apnea.

Obesity was assessed using the body mass index (BMI) and waist circumference, which were measured at the time of collection. Individuals with BMI equal to or greater than 30 kg/m^2 and/or individuals with waist circumference greater than 88 cm for women and 102 cm for men were considered obese.[5] To obtain the body mass index, individuals were weighed barefoot, on a digital scale calibrated and validated by National Institute of Metrology Standardization and Industrial Quality (*Instituto Nacional de Metrologia, Qualidade e Tecnologia* - Inmetro). Height was obtained using a tape measure, with the individuals barefoot. Waist circumference was measured in centimeters with a tape measure placed around the abdomen at the midpoint between the last palpable rib and the iliac crest, on the axillary midline.

Excessive salt consumption was assessed based on the patient's report. Daily values greater than 5 g of salt were considered excessive, equivalent to a teaspoon of salt.[6]

Sedentary lifestyle was assessed based on the patient's report, in which individuals who did not follow the recommendation of 150 minutes of moderate intensity physical activity or 75 minutes of higher intensity activities in a week were considered sedentary.[7]

Alcohol consumption was assessed using the patient's report and alcohol-related disorders were assessed using the Alcohol Use Disorders Indentification Test (AUDIT). The original instrument was developed by the World Health Organization and its validation in Brazil was carried out by Méndez *et al.*[8] It consists of 10 questions, with four alternatives

each. The first three questions make it possible to estimate alcohol consumption and the rest assess the consequences related to its use. The score ranges from zero to 40 points and individuals are classified as follows: zero to seven, low risk or risk zone I; eight to 15 risk or risk zone II; 16 to 19, harmful risk/high risk or risk zone III; over 20, probable dependency or risk zone IV.[8]

Smoking was assessed based on the patient's report, and individuals who smoked 100 cigarettes or five packs in the last 12 months were considered smokers.[9] Patients who reported being smokers were assessed for their level of tobacco dependence using the Fagerström Questionnaire, created by Fagerström in 1978 and adapted by Heatherton *et al.* in 1991. It was translated and validated in Brazil by Carmo and Pueyo in 2002.[10] The questionnaire consists of six questions and has a score ranging from zero to 10 points. The level of dependency was categorized according to the total number of points, as follows: zero to two, very low degree of dependence; three to four, low degree of dependence; five, average degree of dependence; six to seven, high degree of dependency; eight to 10, very high degree of dependency.[10]

Stress was assessed using the Perceived Stress Scale (PSS-10), which measures the degree to which individuals perceive situations as stressful. Its translation into Portuguese was carried out by Luft *et al.*, in 2007.[11] The scale consists of 10 questions with answer options ranging from zero to four (0 = never; 1 = almost never; 2 = sometimes; 3 = almost always; 4 = always). The questions with a positive connotation (4.5; 7.8) had the score reversed, that is, 0 = 4, 1 = 3, 2 = 2, 3 = 1 and 4 = 0. The rest were scored directly. The score can vary from zero to 40 points, and the higher the score, the greater the stress of individuals.[11]

Sleep apnea was assessed using the Berlin Questionnaire and patients were categorized as high or low risk of having sleep apnea. This questionnaire was originally developed in English in 1996 and was validated by Netzer *et al.* In 1999. Its translation into Portuguese was made by Vaz *et al.*[12] This questionnaire includes 10 items, organized into three categories related to snoring and apneas seen, daytime sleepiness and SAH/obesity and each category should be evaluated separately. The determination of high or low risk is based on the responses in each category, where two or more positive categories mean high risk. In the first category, individuals who check alternative "a" in question 1 and 4, "c" or "d" in question 2 are considered to have a positive score; and "a" or "b" in questions 3 and 5. In the second category, individuals who answer two or more of the following alternatives "a" or "b" in questions 6 and 7 and "a" in question 8. In the third category, individuals who report being hypertensive and / or who have a BMI> 30 kg/m² are considered with a positive score.[12]

The sociodemographic and clinical variables were obtained from the patient's report and assessed using an instrument developed and used in a previous study:[13] age, sex, race, education, marital status, family income, housing, number of children and cohabitants and professional occupation.

The individuals were consulted regarding the desire to voluntarily participate in the study. The objectives of the study were clarified, as well as the risks and benefits. And those who agreed signed the free and informed consent form. The project was submitted to and approved by the institution's Ethics Committee (Nr. 1,528,709).

Categorical variables were presented by absolute and relative frequencies and quantitative variables were described as mean, standard deviation, minimum and maximum. The statistical tests used to assess the relationship between cardiovascular risk factors and sociodemographic and clinical variables were the chi-square test, Fisher's exact test or likelihood ratio, ANOVA, Kruskal-Wallis, t-Student test or Mann-Whitney and Spearman's correlation coefficient. Relationships that had values of $p \leq 0.05$ were considered significant.

RESULTS

One hundred six patients with a mean age of 63.5 ± 10.2 years were evaluated, mostly female (n = 73; 68.9%), non-active (n = 73; 68.9%), white (n = 63, 59.4%) and with an average of 6.6 ± 4.6 years of study. Regarding marital status, 64 (60.4%) were married, 18 (17%) widowed, 14 (13.2%) single and 10 (9.4%) divorced. Most had their own housing (n = 81; 76.4%) and received one to three minimum wages (n = 91; 85.8%), followed by three to five (n = 11; 10.4%), five to seven (n = 2; 2%) and only one (0.9%) with a salary lower than one and another who received seven to nine minimum wages. They had, on average, 2.6 ± 1.8 children and 2.2 ± 1.5 cohabitants.

Regarding risk factors, 85 (80.2%) were obese, with a mean BMI of 29.3 ± 5.9 and abdominal circumference for men of 103.4 ± 13.5 and for women of 103.5 ± 13.5. It was observed that 73 (68.9%) were sedentary, 71 (67.0%) were at high risk for obstructive sleep apnea, 25 (23.6%) were using alcohol; six (5.7%) were smokers and 18 (5.7%) were ex-smokers. The average consumption of salt was 0.79 ± 0.6 teaspoons (3.95 grams), ranging from 1.25 to 15 grams, and 16 (15%) individuals consumed salt beyond the recommended amount. The stress score was 14.2 ± 7.6 points.

When using AUDIT, it was found that the average score for alcohol-related disorders was 0.83 ± 2.8 (low risk), with a range from zero (low risk) to 19 (harmful risk/high risk). And when using the Fagerström questionnaire, an average tobacco dependence score of 3.00 ± 1.7 (low dependence) was found,

with a variation from one (very low dependence) to six (high dependence).

Regarding the relationship between these risk factors and sociodemographic and clinical variables, it was found that obesity was related to sex, marital status and number of cohabitants; and sedentary lifestyle was related to professional occupation, age and number of children (Tables 1 and 2).

Table 1 shows that women, divorced and widowed people and those with fewer cohabitants were more obese.

In Table 2, the active ones, younger and with fewer children were more sedentary.

The use of alcoholic beverages was related to sex ($p = <0.0001$) and professional occupation ($p = 0.0372$), in which men and active people consumed more alcoholic beverages than women and non-active ones. Salt consumption was related to the number of cohabitants ($p = 0.0084$, $R = 0.25$), in which the greater the number of cohabitants, the greater the salt consumption. And stress was related to age ($p = 0.0236$, $R = -0.22$), and the younger the age, the higher the stress score. No sociodemographic and clinical variables were related to smoking and sleep apnea.

DISCUSSION

The most prevalent risk factors in this population were obesity, physical inactivity and a high risk of developing obstructive sleep apnea. These risk factors are directly related, since a sedentary life can contribute to excessive weight gain if associated with inadequate nutrition.[14] Obesity increases not only the risk of SAH, but also of other CVDs and metabolic[14] and contributes to the appearance of obstructive sleep apnea. A study shows that the factors that may be associated with the development of obstructive sleep apnea are SAH, high levels of low-density lipoprotein (LDL), high BMI and physical inactivity, factors present in this sample.[15]

Regarding the relationship between sociodemographic and clinical characteristics and the cardiovascular risk factors studied, it was found that obesity was related to sex, marital status and number of cohabitants; sedentary lifestyle, professional occupation, age and number of children; the use of alcoholic beverages, sex and professional occupation; the consumption of salt to the number of cohabitants; and stress, with age.

Women, divorced and widowed people and with a lower number of cohabitants were more obese, results that are in line with other findings in the literature.[16] Women find it easy to gain fatty mass, whether due to hormonal factors, pregnancy, stress, excessive daily activities, lack of time to perform physical activity and inadequate nutrition.[16] The prevalence of obesity in divorced and widowed individuals may be associated with emotional factors in this group of individuals. A study shows that married people and individuals who live with a greater number of cohabitants are likely to have better mental health, with a lower rate of stress and depression than those who live alone.[17] And so they start to have better health-seeking behavior.

In relation to physical inactivity, it was found that individuals with older age, a greater number of children and non-active practiced more physical activity. The elderly population and those who do not work can invest in healthier living habits due to more free time.[18] And the relationship between increased physical activity in individuals with a greater number of children can be explained by the fact that parents are monitoring their children in their activities and/or encouraging them to do this practice.[19,20]

Male individuals and those considered active consume more alcoholic beverages and more alcohol-related disorders. A study reveals that, despite the increase in consumption among the female population, the use of alcoholic beverages remains higher among men and, consequently, the disorders related to its use are also greater in the male public, increasing the risk of developing chronic diseases, including cardiovascular, liver, cancer and mental illnesses.[21] Research found that men who work and have an arduous routine are more consumers of alcoholic beverages, since they relate their consumption to a way of reducing stress and socializing with co-workers.[22]

There was a positive correlation between salt consumption and the number of cohabitants, and the greater the number of cohabitants, the greater the salt consumption. It is known that most families do not prepare different meals according to the comorbidities of each individual. Reeducating and raising awareness in a family in order to change their habits is a complex process, since it is necessary to understand and collaborate with all members involved with the individual with the comorbidity.[23]

There was also a negative correlation between age and stress: the younger the age, the greater the stress. Stress is greater in the active adult population, a fact that may be related to the routine of daily activities. Lack of time, worries, lack of physical activity, unhealthy eating and impaired sleep can contribute not only to increased stress, but also to other factors such as obesity and physical inactivity.[24,25]

In this context, interventions must be carried out in order to reduce the risk factors associated with SAH, such as obesity, physical inactivity and obstructive sleep apnea, as well as strategies must be developed so that there is a change in the lifestyle of people with sociodemographic characteristics. presented in this study.

Table 1 - Relationship between sociodemographic variables and obesity. *São Paulo*, 2016-2017

	Obesity		Total	p-value
	No	Yes		
	n (%)	n (%)	n (%)	
Sex				
Female	7 (9.6%)	66 (90.4%)	73 (100%)	0.0001*
Male	14 (42.4%)	19 (57.6%)	33 (100%)	
Race				
White	15 (23.8%)	48 (76.2%)	63 (100%)	0.2181†
Black	4 (21.1%)	15 (78.9%)	19 (100%)	
Brown	2 (8.3%)	22 (91.7%)	24 (100%)	
Marital Status				
Married	16 (25%)	48 (75%)	64 (100%)	0.0283†
Divorced	0 (0%)	10 (100%)	10 (100%)	
Single	4 (28.6%)	10 (71.4%)	14 (100%)	
Widower	1 (5.6%)	17 (94.4%)	18 (100%)	
Family Income				
Less than 3 minimum wages	19 (20.7%)	73 (79.3%)	92 (100%)	0.7316‡
3 to 9 minimum wages	2 (14.3%)	12 (85.7%)	14 (100%)	
Professional Occupation				
Active	9 (27.3%)	24 (72.7%)	33 (100%)	0.1950*
Non-active	12 (16.4%)	61 (83.6%)	73 (100%)	
Housing				
Rent	2 (15.4%)	11 (84.6%)	13 (100%)	0.8343*
Donated	3 (25%)	9 (75%)	12 (100%)	
Own	16 (19.8%)	65 (80.2%)	81 (100%)	
Age				
Mean (SD)	63.33 (12.45)	63.58 (9.66)	63.53 (10.21)	0.9227†
Median	65	64	64	
Min-Max	37-84	35-87	35-87	
Education in years				
Mean (SD)	8.29 (4.89)	6.14 (4.46)	6.57 (4.6)	0.0834§
Median	11	5	5	
Min-Max	0-16	0-20	0-20	
Number of children				
Mean (SD)	2.62 (1.43)	2.6 (1.93)	2.6 (1.83)	0.6217§
Median	3	2	2	
Min-Max	0-5	0-10	0-10	
Number of Cohabiting				
Mean (SD)	2.95 (1.8)	1.99 (1.4)	2.18 (1.53)	0.0239§
Median	3	2	2	
Min-Max	0-8	0-5	0-8	

SD: standard deviation; min-max: minimum-maximum; * chi-square test; † likelihood ratio test; ‡ Fisher's exact test; Mann-Whitney test.

Table 2 - Relationship between sociodemographic variables and physical inactivity. *São Paulo*, 2016-2017

	Sedentarism		Total	p-value
	Yes	No		
	n (%)	n (%)	n (%)	
Sex				
Female	51 (69.9%)	22 (30.1%)	73 (100%)	0.7421*
Male	22 (66.7%)	11 (33.3%)	33 (100%)	
Race				
White	45 (71.4%)	18 (28.6%)	63 (100%)	0.5213*
Black	11 (57.9%)	8 (42.1%)	19 (100%)	
Brown	17 (70.8%)	7 (29.2%)	24 (100%)	
Marital Status				
Married	46 (71.9%)	18 (28.1%)	64 (100%)	0.487†
Divorced	8 (80%)	2 (20%)	10 (100%)	
Single	9 (64.3%)	5 (35.7%)	14 (100%)	
Widower	10 (55.6%)	8 (44.4%)	18 (100%)	
Family Income				
Less than 3 minimum wages	62 (67.4%)	30 (32.6%)	92 (100%)	0.5415‡
3 to 9 minimum wages	11 (78.6%)	3 (21.4%)	14 (100%)	
Professional Occupation				
Active	28 (84.8%)	5 (15.2%)	33 (100%)	0.0169*
Non-active	45 (61.6%)	28 (38.4%)	73 (100%)	
Housing				
Rent	11 (84.6%)	2 (15.4%)	13 (100%)	0.1689 †
Donated	6 (50%)	6 (50%)	12 (100%)	
Own	56 (69.1%)	25 (30.9%)	81 (100%)	
Age				
Mean (SD)	61.78 (10.23)	67.39 (9.16)	63.53 (10.21)	0.0081*
Median	63	66	64	
Min-Max	35-84	53-87	35-87	
Education in years				
Mean (SD)	6.56 (4.54)	6.58 (4.8)	6.57 (4.6)	0.9918§
Median	5	5	5	
Min-Max	0-20	0-16	0-20	
Number of children				
Mean (SD)	2.34 (1.63)	3.18 (2.13)	2.6 (1.83)	0.0263§
Median	2	3	2	
Min-Max	0-8	0-10	0-10	
Number of Cohabiting				
Number of Cohabiting	2,22 (1,46)	2,09 (1,68)	2,18 (1,53)	0.5868§
Median	2	2	2	
Mín-Máx	0-8	0-6	0-8	

SD: standard deviation; min-max: minimum-maximum; * chi-square test; † likelihood ratio test; ‡ Fisher's exact test; Mann-Whitney test.

CONCLUSION

The risk factors for SAH most identified in this study were obesity, physical inactivity and the high risk of developing obstructive sleep apnea. Obesity was more found in women, divorced and widowed and in homes with fewer cohabitants. Sedentarism was greater in those who have a professional occupation, in the youngest and in those who have a greater number of children; the use of alcoholic beverages was more present in men and active people; salt consumption was higher in homes with a greater number of cohabitants; and the stress was greater in the younger ones. No sociodemographic and clinical variables were related to smoking and sleep apnea. Preventive actions should be carried out for groups of people with these characteristics in order to reduce the complications of SAH.

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