Sociodemographic and clinical factors associated with anxiety in hypertensive women: a cross-sectional study

Fatores sociodemográficos e clínicos associados à ansiedade em mulheres hipertensas: estudo transversal

Factores sociodemográficos y clínicos asociados a la ansiedad en mujeres hipertensas: estudio transversal

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Abstract

Objective: To verify the prevalence of anxiety and its association with sociodemographic and clinical factors in women with hypertension.

Method: This is a cross-sectional study with 258 women with hypertension diagnosed for at least six months and who were treated at the hypertension outpatient clinic of a public institution dedicated to teaching, research and care in the city of São Paulo. The instrument contained sociodemographic, clinical and lifestyle data and was completed through an interview. Anxiety was assessed by the State-Trait Anxiety inventory and classified as low, moderate, high and very high. The assessment of the association between sociodemographic and clinical factors with anxiety level was performed using association tests and simple multinomial logistic regression, considering a significance level of 5%.

Results: It was found that 70.5% had moderate anxiety and 19.4% had high anxiety. In the simple multinomial logistic regression, it was identified that the older the age, the greater the chance of high anxiety (p=0.01; Odds Ratio =1.09), women without a partner were more likely to have high anxiety (p=0.02, Odds Ratio =3.19), and with increasing monthly family income, the chance of high anxiety was lower (p=0.04, Odds Ratio =0.99).

Conclusion: There was a high prevalence of moderate anxiety in the population studied and the absence of a partner was the factor that best explained the anxiety phenomenon. Nurses should propose interventions, especially for these people, in order to reduce this feeling.

Resumo

Objetivo: Verificar a prevalência da ansiedade e sua associação com os fatores sociodemográficos e clínicos em mulheres com hipertensão arterial sistêmica.

Métodos: Estudo transversal com 258 mulheres com hipertensão arterial sistêmica diagnosticada há pelo menos seis meses e que eram atendidas no ambulatório de Hipertensão Arterial de uma instituição pública voltada ao ensino, pesquisa e assistência na cidade de São Paulo. O instrumento continha dados sociodemográficos, clínicos e de hábitos de vida e foi preenchido por meio de uma entrevista. A ansiedade foi avaliada pelo inventário de Ansiedade Traço e classificada em baixa, moderada, elevada e muito elevada. A avaliação da associação entre os fatores sociodemográficos e clínicos com o nível de ansiedade foi realizada pelos testes de associação e regressão logística simples multinomial, considerando o nível de significância de 5%.

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Conflicts of interest: extracted from the course conclusion work entitled "*Fatores Associados à Ansiedade em Mulheres com Hipertensão Arterial*", presented to the Escola Paulista de Enfermagem of the Universidade Federal de São Paulo in 2019. Although Lopes JL is Associate Editor at Acta Paulista de Enfermagem, she did not participate of the peer review process that resulted in the approval of the article.

Resultados: Identificou-se que 70,5% apresentavam ansiedade moderada e 19,4% elevada. Na regressão logística multinomial simples identificou-se que quanto maior a idade maior a chance de ansiedade elevada (p=0,01; *Odds Ratio* =1,09), as mulheres sem companheiro tinham maiores chances de ansiedade elevada (p=0,02, *Odds Ratio* =3,19) e com o aumento da renda mensal familiar menor foi a chance de ansiedade elevada (p=0,04, *Odds Ratio* =0,99).

Conclusão: Houve alta prevalência de ansiedade moderada na população estudada e a ausência de companheiro foi o fator que melhor explicou o fenômeno de ansiedade. Os enfermeiros devem propor intervenções, principalmente para estas pessoas, com o intuito de reduzir tal sentimento.

Resumen

Ocurrencias: Verificar la prevalencia de la ansiedad y su relación con los factores sociodemográficos y clínicos en mujeres con hipertensión arterial sistémica.

Métodos: Estudio transversal con 258 mujeres con hipertensión arterial sistémica diagnosticadas hace seis meses por lo menos y que habían sido atendidas en consultorios externos de Hipertensión Arterial de una institución pública orientada a la educación, investigación y atención en la ciudad de São Paulo. El instrumento contenía datos sociodemográficos, clínicos y de hábitos de vida y fue completado mediante una encuesta. La ansiedad fue evaluada mediante el inventario de rasgos de ansiedad y clasificada como baja, moderada, alta o muy alta. La evaluación de la relación entre los factores sociodemográficos y clínicos con el nivel de ansiedad fue realizada con la prueba de asociación y regresión logística simple multinominal, con un nivel de significación de 5 %.

Resultados: Se identificó que el 70,5 % presentó ansiedad moderada y el 19,4 % alta. En la regresión logística multinomial simple se identificó que, cuanto mayor era la edad, mayor era la probabilidad de ansiedad alta (p=0,01; *Odds Ratio* =1,09), las mujeres sin compañero tenían mayores probabilidades de ansiedad alta (p=0,02, *Odds Ratio* =3,19) y con el aumento de los ingresos familiares mensuales, la probabilidad de ansiedad alta fue menor (p=0,04, *Odds Ratio* =0,99).

Conclusión: Se observó una alta prevalencia de ansiedad moderada en la población estudiada y la ausencia de compañero fue el factor que mejor explicó el fenómeno de ansiedad. Los enfermeros deben proponer intervenciones, principalmente para estas personas, con el objetivo de reducir ese sentimiento.

Introduction

Hypertension is a chronic cardiovascular disease characterized by an increase in systemic blood pressure with values greater than 140 mmHg of systolic blood pressure and/or 90 mmHg of diastolic blood pressure, and its etiology is multifactorial, which can be both hereditary, environmental and/or emotional.[1]

Currently, cardiovascular diseases are the main causes of morbidity and mortality in Brazil, accounting for more than 30% of all deaths.[2] During 2004 and 2014, 457,305 deaths caused by hypertensive diseases and hypertension were recorded, accounting for 3.76% of all deaths recorded in Brazil during this period.[2] In 2019, the main causes of death in Brazil were related to ischemic heart diseases and in second place cerebrovascular diseases, both of which are associated with hypertension.[3]

There are several modifiable or non-modifiable risk factors that contribute to the development and worsening of hypertension. High sodium intake, high-fat and high-calorie diet, alcohol consumption, stress, obesity, overweight and smoking are the main modifiable risk factors for developing hypertension. Non-modifiable risk factors include heredity, ethnicity, age, sex, and menopause.[4]

In women, there is an incidence of hypertension, especially after the drop in estrogen production that occurs between 40 and 55 years old.[5] Additionally, markers of oxidative stress are increased in postmenopausal women, leading to increased blood pressure (BP) by reducing vasodilator bioavailability.[6] Other physical-functional, spiritual and emotional changes, which are frequently present in this population, can influence BP changes.[7] There is evidence that the presence of depression and anxiety are important factors in the pathogenesis of postmenopausal hypertension.

Some studies correlate anxiety level and stress with worsening BP levels,[8,9] and anxiety can be characterized as a vague and uncomfortable feeling of discomfort or fear accompanied by autonomic response triggering palpitations, excessive sweating, excessive tension and changes in heart rate and BP.[10]

Anxiety has two distinct concepts, state anxiety, which is related to a temporary emotional situation and associated with feelings of tension that can vary in intensity over time, and trait anxiety, which is related to a stable personal characteristic, that is, individuals who tend to react with anxiety to stressful situations and to perceive a greater number of situations as stressful.[11]

People diagnosed with cardiovascular disease and trait anxiety characteristics have presented worse medication compliance levels, low daily functional level, lower health-related quality of life,

greater delay in lifestyle modification, which consequently increase hospital costs.[8-10,12] Therefore, it is notorious the importance of nurses knowing the variables that are associated with higher or lower trait anxiety levels in women with hypertension to establish educational interventions to this population individually. Thus, the objective of this study was to verify the prevalence of trait anxiety and its association with sociodemographic and clinical factors in women with hypertension.

Methods

This is a quantitative, cross-sectional and correlational study carried out in 2018 with women over 18 years old, diagnosed with hypertension in outpatient follow-up for at least six months at an Integrated Center for Assistance and Teaching in Hypertension and Cardiovascular Metabology of a university in southeastern Brazil. Women with other cardiovascular disorders, such as heart failure, coronary heart disease and valvular diseases, with less than four years of schooling, use of drugs to treat anxiety and visual or cognitive deficits were excluded, since the scale used to measure anxiety was self-applicable.

The sample calculation was based on a pilot study with 30 women, of whom 91% had moderate and high anxiety. Considering the calculation of proportions for infinite samples with a 95% confidence level and a 5% sampling error, a sample of 152 cases was obtained, but it was decided to increase the sample size in an attempt to complete the maximum number of women seen at the outpatient clinic during the proposed period of data collection, totaling 258 women.

Data were collected on the day of the scheduled consultation at the hypertension clinic and before the medical consultation, after one of the researchers had reviewed the inclusion and exclusion criteria in women's medical records and, in cases of doubt, with the medical team. One of the researchers read and explained the study objectives to the participants, and collected the signature of the Informed Consent Form. An instrument, developed by the researchers, was filled out, containing sociodemographic and clinical data: age (complete years); race/skin color, marital status; family income (number of minimum wages); religion and number of children; presence of other diseases (diabetes mellitus, obesity and dyslipidemia); hormone replacement; and inadequate lifestyle habits (sedentary lifestyle, smoking and use of alcoholic beverages).

To assess anxiety, the State Anxiety-Trait Inventory (STAI) was used, developed in 1970 and validated for Brazilian Portuguese in 1979, consisting of two scales, one of which assesses state anxiety (STAI-E) and the other trait anxiety (STAI-T).[11] For this study, considered as a dependent variable, the scale that assesses trait anxiety was used, as it allows the assessment of a more lasting characteristic of anxiety personality.[12]

This inventory, translated and validated into Brazilian Portuguese, assesses how individuals feel normally and consists of 20 statements. Each item of the scale is assigned a value from 1 to 4, being 1 almost never, 2 sometimes, 3 often and 4 almost always. The total score ranges from 20 (minimum) to 80 (maximum), and the higher the value, the higher anxiety level. In addition to using the score, anxiety level was categorized as low anxiety, when scores were obtained from 20 to 34 points, moderate anxiety, from 35 to 49 points, high anxiety, from 50 to 64 points, and very high, when greater than 65 to 80 points.[12]

Alcohol consumption and smoking were assessed dichotomously (yes/no). In affirmative cases, the weekly frequency of use and the number of packs/day, respectively, were verified. Values greater than 80 cm in the assessment of waist circumference (WC) and 30 kg/m^2 by calculating the Body Mass Index (BMI).[4]

Sedentary lifestyle was assessed using the International Physical Activity Questionnaire – short version (IPAQ), validated in Brazil.[13] This instrument consists of eight questions related to physical activity during the week. Women who performed vigorous activities more than 5 days/week or more than 30 minutes per session were classified as "very active"; when they performed vigorous activities more than 3 times/week or more than 20

minutes/session, "active"; irregularly active type A, those who performed moderate activities 5 times a week or 150 minutes/week; irregularly active type B, those who did not perform moderate activity as described in the previous categorization; and sedentary, those who did not perform any type of physical activity for at least 10 minutes during the week.[13]

The data were stored in a Microsoft Excel® 2010 spreadsheet and subsequently transferred to Statistic version 12.0, an electronic database software. Qualitative variables were presented by absolute and relative frequencies and quantitative variables by mean, standard deviation and those without normal distribution by median and minimum-maximum.

In the univariate analysis of the association between sociodemographic and clinical variables with anxiety level in hypertensive women, likelihood ratio tests between qualitative variables and analysis of variance (ANOVA) were used to compare quantitative variables with qualitative variables, except for family income and waist circumference, for which the non-parametric Kruskal-Wallis test was used. To verify the factors that best explain anxiety level, the Multinomial Logistic Regression Model was used with the forward selection method. The significance level was 5%.

The study was submitted to the Research Ethics Committee of the *Universidade Federal de São Paulo*, approved under Opinion 2,423,159 and CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration) 80282417.6.0000.5505.

Results

A total of 258 women were assessed, with a mean age of 57 years and prevalence for those with incomplete elementary education, with brown skin color, with partners and Catholic, with 97% having at least one child and an average income of R$2,583.00 (about US$469.63) and none of the women reported smoking, according to Table 1.

Dyslipidemia and diabetes mellitus were the most prevalent comorbidities in women included in this study. Regarding life habits, almost all women were irregularly active, only 3.5% used alcoholic beverages weekly, the mean BMI was below what is considered obesity, but the median waist circumference showed values above the normal range. The average of trait anxiety was 45.17±5.33, and 26 (10.1%) had low anxiety, 182 (70.5%) moderate anxiety and 50 (19.4%) high anxiety. No woman with very high anxiety was identified. In the univariate analysis, it was found that women with low and moderate anxiety were younger and women without a partner had a higher prevalence of high anxiety when compared to those with a partner, according to Table 2.

Through the multinomial logistic regression, the influence of the variables age, marital status and monthly income with anxiety level was observed. For each year of age increase, there was an increase of 1.09% in the chance of high anxiety. Women without a partner had a 3.77 times higher chance of high anxiety, and the increase in monthly income by one unit (amount corresponding to the mini-

Table 1. Woman sociodemographic and clinical characteristics (n = 258)

Sociodemographic and clinical factors	Total n(%)
Age, mean (± SD)	57.73(7.42)
Children mean (SD)	2.82(1.23)
Education n(%)	
Incomplete elementary school	89(35.60)
Complete elementary school	76(29.50)
Complete high school	75(29.10)
Higher education	18(7.00)
Race/skin color n(%)	
Brown	106(41.10)
White	84(32.60)
Black	68(26.40)
Marital status n(%)	
With a partner	179(69.38)
Without a partner	79(30.62)
Religion n(%)	
Catholicism	158(61.20)
Evangelicalism	86(33.30)
Other	14(5.50)
Median family income (R$) (Min-Max)	2700(1000-8000)
Diabetes mellitus, n (%)	114(44.20)
Hormone replacement n(%)	7(2.70)
Dyslipidemia n(%)	135(52.30)
Physical activity level n(%)	
Irregularly active A	257(99.60)
Sedentary lifestyle	1(0.40)
Weekly alcoholic consumption (%)	9(3.48)
Mean Body Mass Index (SD)	25.3(1.92)
AC (cm) Median (Min-Max)	83.06(70-89.4)

SD- standard deviation; R$- *reais* (Brazilian currency); Min-Max- minimum-maximum; AC- abdominal circumference; cm- centimeters.

Table 2. Association of anxiety level with sociodemographic and clinical factors (n = 258)

Variables	Anxiety			p-value
	Low	Moderate	High	
Age, mean (SD)	55.58(7.41)	57.37(6.72)	60.16(9.48)	0.01*
Children				
No	0(0)	4(50)	4(50)	0.06†
Yes	26(10.4)	178(71.2)	46(18.4)	
Education n(%)				
Incomplete elementary school	10(11.2)	61(68.5)	18(20.2)	0.99†
Complete elementary school	6(7.9)	56(73.7)	14(18.4)	
Complete high school	10(10.7)	52(69.3)	15(20)	
Higher education	2(11.1)	13(72.2)	3(16.7)	
Race/skin color n(%)				
White	9(10.7)	56(66.7)	19(22.6)	0.89†
Black	6(8.8)	50(73.5)	12(17.6)	
Brown	11(10.4)	76(71.7)	19(17.9)	
Marital status n(%)				
Without a partner	7(8.9)	45(57.0)	27(34.2)	< 0.01†
With a partner	19(10.6)	137(76.5)	23(12.8)	
Religion n(%)				
Catholicism	17(10.8)	110(69.6)	31(19.6)	0.53†
Evangelicalism	9(10.5)	61(70.9)	16(18.6)	
Other	0(0)	11(78.6)	3(21.4)	
Family income (R$), Median (Min-Max)	2600(1000 - 6000)	2600(1000 - 8000)	2050(1000 - 5200)	0.11‡
Diabetes mellitus				
No	15(10.4)	105(72.9)	24(16.7)	0.46†
Yes	11(9.6)	77(67.5)	26(22.8)	
Hormone replacement				
No	26(10.4)	178(70.9)	47(18.7)	0.20†
Yes	0 (0)	4(57.1)	3(42.9)	
Dyslipidemia				
No	15(12.2)	85(69.1)	23(18.7)	0.55†
Yes	11(8.1)	97(71.9)	27(20)	
Physical activity level				
Irregularly active A	26(10.1)	49(19.1)	182(70.8)	0.19†
Sedentary lifestyle	0(0)	1(100)	0(0)	
Alcoholic beverage n(%)				
No	25(10)	174(69.9)	50(20.1)	0.13†
Yes	1(11.1)	8(88.9)	0(0)	
BMI Mean (SD)	25.01(1.81)	25.26(1.96)	25.56(1.81)	0.44*
AC Median (Min-Max)	83.55(78-87)	83.6(78-87)	83.3(78-87)	0.97‡

SD- standard deviation; R$ - *reais* (Brazilian currency); Min-Max- minimum-maximum; BMI- Body Mass Index; AC- abdominal circumference; cm- centimeters; *ANOVA; †likelihood ratio test; ‡Kruskal-Wallis test.

Table 3. Simple multinomial logistic regression between independent variables with anxiety level (n = 258)

Anxiety	Factor	Exp (B)	p-value	OR	95% CI
High versus low	Age	0.08	0.01	1.09	[1.02: 1.16]
High versus low	Marital status (without partner versus with partner)	1.33	0.01	3.77	[1.27: 11.17]
High versus low	Family income	-0.0004	0.04	0.99	[0.9991: 0.9999]

mum wage in force in the year in which data collection was carried out) decreased the chance of having high anxiety by 0.04%, according to Table 3.

Discussion

Hypertension is one of the main modifiable cardiovascular risk factors and is responsible for premature deaths worldwide and the development of many cardiovascular and cerebrovascular diseases, with an estimated global prevalence of 40.6% in adults over 20 years of age with a higher prevalence in women over 65 years when compared to men.[3] The hypertensive women included in the present study had a higher anxiety level, had a higher mean age and had no partner, and in the multiple analysis, income was also associated with anxiety level.

The epidemiological and clinical profile was consistent with other studies. A possible explanation is that the increase in BP is directly related to increasing age, which causes an increase in arterial stiffness and greater exposure to unhealthy lifestyle habits that are acquired during the course of life, such as a sedentary lifestyle, a diet rich in sodium and fat, smoking and alcohol consumption.[1,3] Women over 50 years old have body fat redistribution, which favors an increase in abdominal fat leading to the presence of metabolic syndrome, which may not only contribute to high BP, but interfere with antihypertensive therapies in postmenopausal women.[14]

The high prevalence of other cardiovascular risk factors such as diabetes mellitus, dyslipidemia and low physical activity level identified in this study are similar to those identified in other observational studies, demonstrating that women with hypertension are associated with other comorbidities and inadequate lifestyle habits, which exponentially increases the risk of developing cardiovascular diseases.[3,15]

Anxiety has been considered the most common psychiatric disease in adults and the greatest public health concern. Several studies have investigated the association between psychosocial disorders and cardiovascular diseases including ischemic diseases, hypertension, arrhythmias and sudden death. As hypertension and anxiety have become important challenges for public health, their association has attracted the attention of researchers. [8,16]

Results of this study showed that most women had moderate anxiety, which corroborates the data from several studies.[9,17-19] A study that analyzed 9,182 women for a follow-up period of 15 years showed that anxiety increases the risk of developing hypertension by 24%.[9] Another study showed that anxiety increases the chance of developing hypertension by 4.24 times[19]. According to a meta-analysis that included eight studies, anxiety increased the chance of developing hypertension by an average of 1.55 times.[8] Other studies also show that the presence of hypertension causes anxiety.[8,10]

When analyzing the association of anxiety level with sociodemographic and clinical factors, it was observed in the univariate analysis that the highest anxiety level was associated with people with a higher average age and without a partner. In the multinomial logistic regression, these same variables increased the chance of high anxiety and it was also identified that the increase in monthly income was associated with a lower chance of presenting high anxiety in the women interviewed in this research. These data were also identified in a longitudinal study with women in which age and marital status increased the chance of association between anxiety and hypertension, but without significance, after adjustment, with depression.[9]

On the other hand, another study identified that increasing age, especially in older adults, led to a lower rate of anxiety and an increase in the rate of depression, which is associated with the development of clinical diseases, functional impairment, less physical activity and a low social support level.[20] In the present study, probably the increase in anxiety level in women with a higher average age is due to the fact that the sample included, for the most part, is composed of women in the middle age group who are still under the influence of female sex hormones, as well as the various roles played by women in relation to recent changes in society, such as double working hours and responsibility for caring for children, intensifying work overload and consequently anxiety.[21]

With regard to marital status, it was identified that patients without a partner were more likely to present high anxiety. This result corroborates the results of a study in which women with partners had less anxiety.[22] Marital status interferes with human beings' quality of life, showing that patients who lived with partners had a better quality of life than those who lived without partners, with a relationship with physical, psychological and social aspects.[23] These findings may be related to the changes that have taken place in Brazilian society, in which most families have women as the main providers of family income, which, consequently, leads to an increase in anxiety and stress levels.[24]

In the simple logistic regression analysis, income was associated with anxiety level in women with hypertension, corroborating another study that showed that people with lower family income

tend to have a higher probability of developing mood disorders, anxiety and chemical use.[25]

Given the data identified in women with hypertension whose age, family income and marital status were associated with a higher anxiety level, clinical practice nurses, when identifying these variables in women with hypertension, should reflect on the importance of implementing individual or group educational measures aimed at better emotional control, such as greater encouragement of physical activity and exercise, relaxation practices, use of florals and cognitive behavioral therapy sessions.[26,27]

Associated with these integrative and educational practices, nurses can also use soft-hard or hard technologies, such as text messages for mobile telephony, teleconsultation/telemonitoring or even the use of mobile phone applications that encourage and enable adherence and anxiety control in this population. [28,29]

Other studies may be carried out including women with hypertension and other cardiovascular diseases that were excluded in this study, in order to assess whether the presence of other comorbidities associated with hypertension may influence anxiety level, being considered a limitation of this study.

Conclusion

It was identified that 70.5% of hypertensive women had moderate anxiety and 19.4% had high anxiety. In the analysis of simple multinomial logistic regression, it was observed that the higher the age, the greater the chance of high anxiety, that women without partners had a greater chance of high anxiety and that the increase in monthly income reduced the chance of high anxiety. Given these results, nurses should implement interventions to reduce anxiety, which, consequently, may contribute to BP control, reduce the number of medications and improve women's quality of life.

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Collaborations

Silva TC, Santos VB, Cavalcante AMRZ, Hirano GSB, Lopes JL, Barros ALBL contributed to the study design, data analysis and interpretation, article writing, relevant critical review of the intellectual content and approval of the final version to be published.

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