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## ASSOCIATION OF SELF-REPORTED PAIN WITH QUALITY OF LIFE IN RESISTANT HYPERTENSIVE PATIENTS

*Associação da dor autorrelatada com a qualidade de vida no hipertenso resistente**Asociación del dolor autorreportado con la calidad de vida en pacientes hipertensos resistentes*Valeriana Cantanhede Rodrigues<sup>1</sup> Dayse Mary da Silva Correia<sup>2</sup> Kalliza Kary Rodrigues da Costa<sup>3</sup> Luanna Barci Dutra da Costa<sup>4</sup> 

### ABSTRACT

**Objective:** to analyze the association between self-reported pain and the quality of life of resistant hypertensive patients in the context of the Covid-19 pandemic. **Method:** cross-sectional and analytical study, carried out in a university hospital, from January to February 2022. Data collection was carried out by searching medical records and by telephone, using the McGill Pain and Quality of Life Questionnaires in Arterial Hypertension (Minichal – Brazil). In the statistical analysis, the Mann-Whitney test and the Spearman coefficient ( $\rho$ ) were used. **Results:** female predominance (88.1%), aged between 50 and 70 years (69.1%), with arterial hypertension for more than 20 years (42.9%), estimated “mild to severe” pain (64.3%), good quality of life (47.6%), with a significant association in hypertensive patients with high total cholesterol. **Conclusion:** identification of the sample profile, association of self-reported pain and the quality of life of resistant hypertensive patients in the context of the Covid-19 pandemic.

**DESCRIPTORS:** Pain referred; Hypertension; Nursing;

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## RESUMO

**Objetivo:** analisar a associação da dor autorrelatada e a qualidade de vida de hipertensos resistentes no contexto da pandemia de Covid-19. **Método:** estudo transversal e analítico, realizado em hospital universitário, no período de janeiro a fevereiro de 2022. A coleta de dados deu-se por busca em prontuário e por contato telefônico, com a utilização dos Questionários de Dor de McGill e Qualidade de Vida em Hipertensão Arterial (Minichal – Brasil). Na análise estatística foi usado o teste de Mann-Whitney e o coeficiente de Spearman ( $\rho$ ). **Resultados:** predominância feminina (88,1%), com idade entre 50 e 70 anos (69,1%), com hipertensão arterial há mais de 20 anos (42,9%), estimativa de dor “leve a severa” (64,3%), boa qualidade de vida (47,6%), com associação significativa em hipertensos com colesterol total alto. **Conclusão:** identificação do perfil da amostra, associação da dor autorrelatada e a qualidade de vida de hipertensos resistentes no contexto da pandemia da Covid-19.

**DESCRIPTORIOS:** Dor referida; Hipertensão; Enfermagem;

## RESUMEN

**Objetivos:** analizar la asociación entre dolor autorreferido y calidad de vida de hipertensos resistentes no contexto de la pandemia de Covid-19. **Método:** estudio transversal y analítico, realizado en un hospital universitario, en el período de enero a febrero de 2022. Una recopilación de datos realizada por medio de búsqueda en prontuarios y por teléfono, por medio de los cuestionarios McGill de Dor e Qualidade de Vida em Hipertensão Arterial (Minichal – Brasil). En el análisis estadístico se utilizan las pruebas de Mann-Whitney y el coeficiente de Spearman ( $\rho$ ). **Resultados:** predominio do sexo feminino (88,1%), edad entre 50 y 70 años (69,1%), con hipertensão arterial há mais de 20 años (42,9%), dor estimada “leve a intensa” (64,3%), boa qualidade de vida (47,6%), com associação significativa em hipertensos com colesterol total elevado. **Conclusión:** identificación del perfil de nuestra muestra, asociación del autorreferido y calidad de vida dos hipertensos resistentes en el contexto de la pandemia de Covid-19. **Conclusión:** se identificó el perfil de la muestra y la asociación entre el dolor autoinformado y la calidad de vida de los hipertensos resistentes en el contexto de la pandemia de Covid-19.

**DESCRIPTORIOS:** Dolor referido; Hipertensión; Enfermería.

## INTRODUCTION

Pain is of fundamental importance in protecting life, as it has the function of alerting threats and possible dysfunctions, in order to preserve the integrity of the human organism.<sup>1</sup> Its recent concept is "an unpleasant sensory and emotional experience associated, or similar to that associated, with an actual or potential tissue injury".<sup>1</sup>

In isolation, pain is reported by 37% of the Brazilian population, i.e. 60 million people with Chronic Non-Communicable Diseases (CNCD) and when linked to Systemic Arterial Hypertension (SAH), it affects around 18.5% of the economically active population. Furthermore, when associated, they can increase the chances of a worsening quality of life (QoL) by almost twofold when compared to normotensive patients without pain.<sup>1-2,3</sup>

In addition, it is an individual and subjective experience, which interferes with each individual's perception of their life and requires actions aimed at well-being and quality of life.<sup>2</sup>

By definition, quality of life portrays the subjectivity of individuals' perception of whether their needs are being met or whether there are negatives in the possibility of achieving self-realization and happiness, independently of their state of physical and mental health or social and economic conditions.<sup>4</sup>

However, research into the relationship between pain, quality of life and hypertension is still scarce, especially in the context of the Covid-19 pandemic between 2020 and 2022.

Hypertension is an important predictor of cardiovascular disease, present in 60% of heart attacks and 80% of strokes, as well as chronic kidney disease, which can lead to premature death.<sup>5</sup>

It is worth noting that systemic arterial hypertension (SAH) is highly prevalent in the world. It is estimated that global spending averages US\$630.14 per person. In Brazil, it is estimated that 38 million people have the disease and of these, 60% are elderly. It is defined as blood pressure (NP) values of  $\geq 140 \times 90$  mmHg, measured on two separate occasions and in the absence of antihypertensive medication. In addition, it is classified as Resistant Arterial Hypertension (RAH) when the pressure measured in the doctor's office remains high, even with the continuous use of three or more antihypertensive drugs, one of which is a diuretic, or when four or more drugs are used.<sup>3,5</sup>

The control and continuity of treatment of hypertensive patients with or without pain has become complex with the Covid-19 pandemic, due to social isolation, suspension of face-to-face outpatient care, difficulty in accessing the health service, with a possible worsening of quality of life.<sup>6</sup> Thus, the management of care has been impaired, for example, where the use of analgesic drugs can positively or negatively affect blood pressure control.<sup>7</sup>

Therefore, the aim of this investigation was to analyze the association between self-reported pain and the quality of life of resistant hypertensive patients in the context of the Covid-19 pandemic.

## METHOD

This is an observational, cross-sectional, descriptive, analytical, retrospective study with a quantitative approach guided by the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) statement.<sup>8</sup> It is part of the "Interdisciplinary Project for Systemic Arterial Hypertension Follow-up in a Virtual Environment (PISAV\_HAS) in the context of the COVID-19 pandemic - Phase 1".

The study was carried out at the Resistant Hypertension Outpatient Clinic of a university hospital in the state of Rio de Janeiro, with a population of approximately 160 hypertensive patients, and a non-probabilistic convenience sample of 42 resistant hypertensive patients.

The inclusion criteria were: over 18 years of age and of both sexes. The exclusion criteria were: those with cognitive and hearing impairment and those unable to talk on a telephone.

Data collection took place in January and February 2022 in two stages, namely: in the first, a search was carried out in the clinical records held by the university hospital, using an instrument designed for sociodemographic data (gender, age, skin color, education, marital status, time since diagnosis of hypertension and smoking) and clinical data (comorbidities); in the second, it was done by telephone contact made available in the hospital record by the participant, using two questionnaires. In other words, the short version of the MCGILL Pain Questionnaire<sup>9</sup> was used to estimate pain and the Mini-questionnaire for Quality of Life in Hypertension (Minichal-Brasil) was used for quality of life.<sup>10</sup>

The MCGILL Pain Questionnaire<sup>9</sup> identifies the affective, sensory and evaluative components of pain, and is effective in obtaining qualitative and quantitative information from verbal descriptions. It consists of 15 (fifteen) representative words in the following categories: sensory (eleven expressions) and affective (four expressions). The answers to the domains are distributed on a Likert-type scale, with four answer options: 0 (none), 1 (mild), 2 (moderate) and 3 (severe). The sum ranges from 0 to 45 points, with a score of "zero" showing that the person has no pain.<sup>9</sup>

The Minichal-Brazil<sup>10</sup> consists of 16 questions, divided into mental state and somatic manifestations. In addition, there is a question in which the interviewee assesses whether hypertension and its treatment have influenced their quality of life. The answers are arranged on a Likert-type scale, with four response options: 0 (Not at all), 1 (Yes, a little), 2 (Yes, a lot) and 3 (Yes, a lot). The maximum score for Mental State is 30 points, and for Somatic Manifestations it is 18 points, the closer the score is to zero, the better the quality of life.<sup>10</sup>

Both the single instrument and the questionnaires mentioned were created using Google Forms<sup>®</sup> and made available to the research team, which was made up of six nurses, one of whom was a nursing lecturer and the research coordinator, as well as four nursing undergraduates. To this end, they were all trained by the research coordinator, where each one was respon-

sible for contacting an average of 15 (fifteen) participants, for whom they used their own cell phone with a chip and a specific number for the research and expected to call in the first week of the months mentioned from Monday to Friday from 10am to 4pm, with an average duration of 20 minutes per contact.

As the data was recorded on the Google Forms<sup>®</sup> spreadsheet, it was structured in an Excel<sup>®</sup> spreadsheet using the software, and then analyzed using SPSS (Statistical Package for Social Science), version 22.0.

Descriptive analysis was carried out using frequency distributions and the calculation of descriptive statistics. Thus, the variability of the distribution of a quantitative variable was considered low if  $CV < 0.20$ ; moderate if  $0.20 \leq CV < 0.40$  and high if  $CV \geq 0.40$ . The distributions were compared using the Mann-Whitney test. Correlations were analyzed using Spearman's coefficient ( $\rho$ ), with a t-test for significance, which was considered strong when the value of  $\rho > 0.7$ . The tests considered a 5% significance level.

It should be noted that voluntary participation was ensured at the start of data collection by means of an initial invitation and the reading and acceptance of the Informed Consent Form (ICF), both sent and recorded via Whatsapp<sup>®</sup>.

Ethical aspects were respected based on Resolution No. 466/2012 of the National Health Council and Circular Letter No. 2/2021/CONEP/SECNS/MS, specific for research in a virtual environment during the pandemic, with approval by the Research Ethics Committee of the Faculty of Medicine of the Fluminense Federal University under opinion No. 5.207.329.

## RESULTADOS

Of the 42 participants in this survey, the following profile can be drawn: female (88.1%), aged  $\geq 50$  years to  $\leq 70$  years (69.1%), brown skin color (40.5%), with a steady partner (47.6%), completed high school (35.7%), with Diabetes Mellitus (47.6%), Dyslipidemia (31%), Chronic Kidney Disease (21.4%) and diagnosed with hypertension more than 20 years ago (42.9%); using losartan potassium (66.7%), amlodipine besylate (50%), hydrochlorothiazide (42.9%), atenolol (38.1%), chlorthalidone (35.7%), atenolol (26.2%), furosemide (26.2%), spironolactone (21.4%), simvastatin (50%) and metformin (28.6%). Smoking was reported by 9 participants (21.4%) and among those who smoked, 2 said they smoked 3 packs of cigarettes a day and another 2 said they smoked 1 pack of cigarettes a day.

When analyzing the tests of interest, the following frequency of abnormalities was observed: high glycated hemoglobin (78.6%), high glucose (59.5%), high total cholesterol (50.0%), high hematocrit (45.2%), high urea (28.6%) and high creatinine (26.2%).

As for the pain score, which used the McGill Questionnaire, it showed a frequency of "no pain" (35.7%), "mild pain" (28.6%), "moderate pain" (26.2%) and "severe pain" in 9.5% of the sample.

Table 1 shows the analysis of the association between the Pain Score and qualitative factors, considering factors that occur with frequencies  $\geq 20\%$  and  $\leq 80\%$ . Only one factor was found to be associated with the Pain score: male gender. In other words, when the statistics for the pain scores of the male and female groups are compared, it can be concluded that the pain score is significantly lower in the male group (p-value=0.021 from the Mann-Whitney test), and no other factor was significantly associated with the Pain score with  $p>0.05$ .

Therefore, in the Minichal classification, the answers "Not at all" and "Yes a little" were more frequent, meaning that the participants in this study have a high quality of life according to the Minichal score (47.6%).

The analysis of the association between the Minichal score and qualitative factors is shown in Table 2. Only one factor was found to be associated with the Minichal score: high total cho-

lesterol. The Minichal score is significantly lower in the group with high total cholesterol ( $p=0.028$  in the Mann-Whitney test) and this means that the group with high total cholesterol has a higher quality of life. The difference in the mean score of the two groups is 7.3 points and the difference in the median is 10 points. No other factor evaluated was significantly associated with the Minichal score with  $p>0.05$ .

The correlation matrix shows that the total number of comorbidities is moderately correlated with age and indicates that older hypertensive patients tend to have a greater number of comorbidities. Similarly, the Minichal score is moderately correlated with the pain score and reveals that individuals with a high pain score tend to have a high Minichal score. Therefore, low quality of life is moderately correlated with high pain scores, i.e. pain has a significant impact on reducing quality of life, but with a moderate correlation (Table 3).

**Table 1** - Analysis of the association between the Pain score and qualitative factors (n=42). Niterói, RJ, Brazil, 2022.

Factor	Pain score in the group where the factor is absent			Pain score in the group where the factor is present			p-value of Mann-Whitney test
	Average	Median	DP	Average	Median	DP	
Male	12,6	12,0	11,8	0,6	0,0	1,3	0,021
Living with a partner	11,4	8,0	12,7	10,9	7,0	11,0	0,787
Diabetes Mellitus	10,0	1,5	12,7	12,5	11,0	10,9	0,246
Dyslipidemia	11,9	12,0	12,0	9,5	5,0	11,5	0,676
Chronic Kidney Disease	12,2	12,0	11,6	7,2	0,0	12,4	0,213
Smoking	12,3	10,0	12,1	7,0	0,0	9,9	0,224
Losartan	12,4	12,5	12,3	10,5	6,0	11,7	0,733
Anlodipine	11,3	8,0	10,9	11,0	4,0	12,9	0,554
Simvastatin	9,9	6,0	10,9	12,4	8,0	12,7	0,554
Hydrochlorothiazide	9,7	4,5	11,7	13,1	14,5	12,0	0,435
Atenolol	9,8	5,5	11,5	13,3	13,5	12,2	0,277
Chlorthalidone	11,8	12,0	11,5	10,0	5,0	12,6	0,697
Atensin	9,2	4,0	10,8	16,7	18,0	13,0	0,092
Furosemide	11,0	6,0	12,1	11,6	10,0	11,4	0,714
Spironolactone	12,1	6,0	12,6	7,8	8,0	7,8	0,348
High glucose	10,7	6,0	12,7	11,4	10,0	11,4	0,783
High Total Cholesterol	11,3	8,0	11,4	11,0	5,0	12,5	0,718
High hematocrit	11,8	10,0	11,4	10,3	3,0	12,5	0,493
High Urea	12,6	13,0	11,8	7,6	1,5	11,5	0,219
High Creatinine	11,9	12,0	12,0	9,0	5,0	11,4	0,632

Source: PISAV\_HAS survey data, 2022.

**Table 2** - Analysis of the association between the Minichal score and qualitative factors (n=42). Niterói, RJ, Brazil, 2022.

Factor	Minichal score in the group where the factor is absent			Escore Minichal no grupo em que o fator é presente			p-valor do teste de Mann-Whitney
	Average	Median	DP	Average	Median	DP	
Male	16,9	16,0	10,8	8,0	10,0	5,3	0,080
Living with a partner	15,0	14,5	10,9	16,9	14,0	10,7	0,537
Diabetes Mellitus	14,4	11,0	11,1	17,5	16,5	10,3	0,262
Dyslipidemia	16,8	16,0	10,9	13,8	12,0	10,5	0,414
Chronic Kidney Disease	16,8	16,0	10,9	12,4	12,0	9,9	0,262
Smoking	16,6	15,0	11,0	13,3	10,0	9,8	0,364
Losartan	16,1	14,5	10,0	15,8	13,0	11,2	0,831
Anlodipine	16,4	15,0	10,3	15,4	11,0	11,4	0,597
Simvastatin	17,0	17,0	11,4	14,7	12,0	10,1	0,615
Hydrochlorothiazide	14,5	11,5	11,0	17,7	19,5	10,4	0,258
Atenolol	15,0	14,0	9,8	17,3	15,0	12,3	0,595
Chlorthalidone	17,0	17,0	10,9	13,8	11,0	10,5	0,344
Atensin	15,3	14,0	10,8	17,5	15,0	10,8	0,463
Furosemide	14,7	11,0	10,2	19,3	17,0	11,9	0,282
Spironolactone	15,2	14,0	10,7	18,4	16,0	11,0	0,397
High Glycated Hemoglobin	12,0	11,0	7,2	16,9	16,0	11,3	0,333
High glucose	15,7	14,0	10,0	16,0	12,0	11,4	0,989
High Total Cholesterol	19,5	20,0	11,1	12,2	10,0	9,1	0,028
High hematocrit	16,8	17,0	11,2	14,7	12,0	10,2	0,569
High Urea	17,7	17,5	11,0	11,3	10,0	8,8	0,064
High Creatinine	16,7	14,0	11,3	13,6	14,0	8,7	0,535

Source: PISAV\_HAS survey data, 2022.

**Table 3** - Correlation matrix between the study's quantitative and ordinal variables (age, schooling, total comorbidities, total medication, time since diagnosis of hypertension and scores (n=42). Niterói, RJ, Brazil, 2022.

P p-value*	Age	Education	Total comorbidity	Total medicines	Time of SAH	Minichal score	Pain Score
Age	1,00	-0,15	0,51	0,21	0,23	-0,43	-0,25
		0,357	0,001	0,187	0,145	0,004	0,117
Education	-0,15	1,00	-0,17	0,10	0,01	0,08	0,11
	0,357		0,293	0,514	0,942	0,634	0,496
Total comorbidity	0,51	-0,17	1,00	0,17	0,15	-0,39	-0,17
	0,001	0,293		0,296	0,346	0,011	0,268
Total medicines	0,21	0,10	0,17	1,00	0,30	0,17	0,25
	0,187	0,514	0,296		0,057	0,291	0,110
SAH time	0,23	0,01	0,15	0,30	1,00	0,09	0,17
	0,145	0,942	0,346	0,057		0,582	0,278

Minichal Total Score	-0,43	0,08	-0,39	0,17	0,09	1,00	0,51
	0,004	0,634	0,011	0,291	0,582		0,001
Pain score	-0,25	0,11	-0,17	0,25	0,17	0,51	1,00
	0,117	0,496	0,268	0,110	0,278	0,001	

SAH: Systemic Arterial Hypertension; Minichal: Mini-questionnaire of quality of life in arterial hypertension.

## DISCUSSION

Pain, like high blood pressure, can influence quality of life. Although interconnected, little is known about the experience of pain in hypertensive patients.<sup>11-12</sup>

A population study shows an inverse relationship between hypertension and pain. However, it is known that there is an increased risk of hypertension in those with pain compared to those without. The relationship between the two can be affected by the use of medication, gender, level of education, comorbidities, among others.<sup>11,13</sup>

In this study, the predominance of hypertension in females was 88.1%, which is normally observed in the literature after the age of 60. Unlike males, who tend to have higher blood pressure at a younger age.<sup>12</sup>

In a population-based study, women had a higher prevalence of hypertension and pain complaints, with 26.5%, compared to men, possibly associated with greater demand for health services, unlike the Chinese, who stated that women are more inclined to neglect the symptoms of hypertension, leaving them more vulnerable to complications and pain.<sup>12,14</sup>

When analyzing the age group, it can be seen that approximately 70% are between 50 and 70 years old, which is found among Brazilians, since 60% of individuals over 60 are hypertensive and this number tends to increase, due to the epidemiological transition and consequent growth in the number of elderly people.<sup>5</sup>

The use of Minichal in Slovenia, for example, was found to be problematic in terms of pain and discomfort, although few had problems with quality of life. Similar results were found in China. However, in the UK, Hong Kong and Colombia, a lower quality of life was demonstrated, which may be attributed to the average age of the sample, which is 75.3 years. Hypertensive cohort participants aged over 60 showed worse results in terms of pain and quality of life compared to a group of people aged between 18 and 29.<sup>15-16</sup>

Longevity may help in the link between pain and hypertension. There is evidence to show that ageing is associated with a reduction in parasympathetic tone, which leads to impaired regulation of blood pressure and pain modulation. Among the elderly, there is a decrease in pain sensitivity when compared to young people.<sup>17</sup>

Brown skin color was self-reported by the majority of participants, going against the data found on quality of life in relation to race, which indicate that the estimated burden of health

conditions impacted the various skin colors in similar ways when it comes to pain and hypertension stimuli, confirming the risk factor for the Global Burden of Disease equal for race and ethnicity. In reality, there are differences in the literature regarding the association between hypertension and race/color. It is believed that there is a genetic predisposition for people with black skin color, as well as socioeconomic conditions, such as racism and lifestyle.<sup>18</sup>

Although the mechanisms are not entirely clear, the results show that marriage is associated with better quality of life outcomes, according to this research. This may be because couples are more motivated to maintain their health and help each other cope with the disease process, due to the support they share. There is encouragement to help with treatment, with discipline and obeying the requirements proposed for well-being, because one helps the other to maintain a healthy life. Single hypertensive patients, due to divorce or widowhood, had the worst pain scores when their quality of life was assessed. This was also seen among those treated by the family health strategy in Minas Gerais, when they answered the Minichal during their quality of life assessment.<sup>19</sup>

There is a significant association between level of education and quality of life, as surveys on the level of education of hypertensive patients with pain in Brazil have shown that a large proportion of the population has a low level of education, which may be linked to difficulties in adhering to treatment and a lesser understanding of the chronicity of hypertension and pain, making it difficult to adopt lifestyle changes. Low levels of quality of life have also been observed in hypertensive patients with pain who have a high level of education, as they usually hold positions with great responsibilities and stress, neglecting self-care.<sup>20</sup>

In disagreement with what is normally found, the hypertensive participants showed no statistical association between the variables mentioned above. However, understanding sociodemographic factors is useful for a better understanding of the social and family context, as well as for the foundation and planning of health measures aimed at reducing the repercussions of pain and hypertension on the treatment and lives of these people.<sup>21</sup>

In this context, pressure control is more difficult in diabetic individuals than in non-diabetic ones and they are often asymptomatic and predictive of cardiovascular disease.<sup>5</sup>

Hypertension associated with diabetes is a common clinical presentation. In addition to self-reported pain, Nigerians, like

the participants in this study, had good results when it came to quality of life. On the other hand, pain was reported on a large scale in Japan and Tehran, as a contributor to lower quality of life.<sup>21</sup>

There is evidence in the literature that diabetics with uncontrolled blood pressure and complaints of pain have a lower quality of life than non-diabetics with controlled blood pressure. Adequate blood pressure control and quality of life have a proportional relationship.<sup>21</sup>

Dyslipidemia, together with hypertension, causes an increase in risk factors for cardiovascular disease.<sup>22</sup> NP, when studying quality of life in Mongolia, it was found that hypertensive patients with dyslipidemia and pain had worse results, while the group with good quality of life was not.<sup>22</sup>

Among the hypertensive patients studied, the majority reported living with the disease for more than 20 years. The longer the duration of hypertension, the greater the risk of developing pain complaints, as well as chronic diseases secondary to hypertension, such as cardiovascular diseases.<sup>23</sup>

Physiological mechanisms tend to explain the association between blood pressure and pain, after years with the disease, due to the reduced sensitivity of the baroreceptors, pointing to problems in regulation, pain sensitization and the cardiovascular system. In this way, there is a risk of an increase in cardiopathies, such as a worsening of hypertension, but also in the differentiation of pain perception.<sup>23</sup>

In terms of the polypharmacy of resistant hypertension, the participants in this sample use losartan potassium and anlodipine besylate in combination, which have been shown to offer a significant rate of reduction in blood pressure and, when combined with simvastatin, provide a better reduction in LDL cholesterol compared to other therapies. This combination demonstrates a good safety profile by promoting a reduction in blood pressure, which in a long-term evaluation was > 90%, exerting beneficial effects on cardiovascular complications and outcomes in resistant hypertensive patients.<sup>24</sup>

There is evidence that hypertensive patients who do not use medication continuously have a better quality of life compared to those who do, i.e. quality of life was impaired as blood pressure was controlled by drug treatment and pain complaints were associated. In another group of hypertensive patients who used antihypertensive drugs continuously, there were reports of complaints of various bodily pains.<sup>25</sup>

On the other hand, adherence to medication increases quality of life, which corresponds to an improvement in the hypertensive patient's general state of health. The correct use of medication prevents various secondary chronic diseases and their symptoms. This highlights the improvement in quality of life inherent in following pharmacological treatment.<sup>24-25</sup>

Among the participants analyzed, few reported using tobacco. This may represent care and attention to health. The same data was found when cardiovascular risk factors were analyzed in 418 users of the Unified Health System (SUS) and the minority smoked. Daily lifestyle habits are an important risk

for cardiovascular diseases and are among the main causes of death, characterizing one of the main public health problems.<sup>26</sup>

As with the sociodemographic factors, the clinical data provided by the participants and used in this study was not statistically associated with the pain and quality of life scores.

However, understanding this information is very useful for health workers, in order to get to know the daily lives of hypertensive patients with secondary diseases, with the aim of supporting and outlining health actions to promote self-care and improve lifestyles.<sup>26</sup>

In the USA, 50% of the population studied reported various types of pain. Hypertensive women had a higher prevalence of pain and habitual use of analgesics. In an Australian cohort of women, hypertension was found to be positively associated with pain. In an analysis in China with hypertensive patients of both sexes, pain was the most frequently reported problem, as in other publications of the same nationality.<sup>27</sup>

The data from this investigation showed that pain prevails in the female group, in line with the findings in the literature, as seen in an epidemiological study on quality of life with hypertensive patients, which observed that the perception of pain was worse in females than in males, especially in older age due to menopause and hormonal dysfunctions. A systematic review showed that women have been shown to have lower pain thresholds and tolerance and are likely to experience greater intensity and discomfort from pain, with potential damage to quality of life.<sup>28</sup>

Although there is insufficient information on the mechanisms behind gender differences in pain perception and prevalence, there is evidence of differences in signaling and hormone production. These are proven to be important factors in the prevalence of pain in women. NP, testosterone is believed to play a protective role in inflammatory and pain conditions, a possible explanation for the scarce reports among men. In women, estrogen plays a protective role against inflammation and pain. On the other hand, with the onset of the menopause, estrogen decreases and pain intensifies.<sup>27-28</sup>

It has been proven that women experience more pain than men, but in this study they did not suffer any loss of quality of life.

In this group, the Minichal test showed good indicators, showing that hypertension, self-reported pain and its treatment did not have a negative impact on the quality of life of the population studied. Unlike the total scores for somatic manifestations found in other studies conducted with the same profile of participants.<sup>29</sup>

The use of the Minichal as an instrument for assessing quality of life is of great importance to health professionals and researchers, as it makes it possible to appreciate the biopsychosocial impact that hypertension and its treatment can have on groups of people from different backgrounds, as well as factors that can influence a person's lifestyle.<sup>29</sup>

The relationship between comorbidities and hypertension in long-lived individuals was found to be significant, as is usually

seen in the literature; however, their quality of life was not impaired. As observed in 2845 hypertensive patients with reports of pain in China, aged 60 years or more.<sup>29</sup>

It is understood that high-density lipoprotein (HDL) cholesterol and total cholesterol in older women is considered a predictor of the risk of cardiovascular disease, due to the reduction in sex hormones, particularly oestradiol, a cardiovascular protector.<sup>30</sup>

It is also believed to be inversely related to the risk of cardiovascular disease, as it is estimated to reduce it, although there is no evidence of this. There is evidence that the composition of the HDL molecule changes as a result of physiological and pathological conditions. Obesity and diabetes can reshape its composition and functionality, causing vulnerability to cardiovascular disease.<sup>30</sup>

Therefore, it is highly associated with cardiovascular risk when transported by small HDL molecules. Clearly, plasma concentrations are not appropriate markers for the risk of these types of diseases and so are not a focus for effective treatment. Therefore, investigating the functions of this type of cholesterol, rather than the concentrations, can provide more assertive therapy.<sup>30</sup>

The hypertensive patients taking part in this study, most of whom were elderly women with high rates of HDL cholesterol, showed a good quality of life, although the obesity variable was not studied and diabetes was not statistically associated.

Still on the subject of quality of life, high HDL cholesterol in hypertensive adults was also positively correlated with the five-dimensional, three-level EuroQol index (EQ-5D-3L) and the EuroQol visual analog scale (EQ-VAS). In this way, it was shown that its increase in the body was positively related to extroverted personality traits and learning ability, but there is still a need to understand the mechanism, which requires further research.<sup>29</sup>

Glycated hemoglobin acts as a long-term indicator of glycaemia. NP directly regulates the lipids in the blood, contributing to increased blood viscosity, arterial stiffness and predisposition to cardiovascular disease. It was linked to all possible causes of death and coronary heart disease in 31,148 adults and only it was associated with non-diabetics.<sup>29</sup>

This study showed that the coexistence of high glycated hemoglobin, painful stimuli and systemic arterial hypertension did not alter the participants' quality of life. So far, there are inconsistencies about this relationship. However, men who are single and have an increased level of glycated hemoglobin are at greater risk of having an impaired quality of life.<sup>30</sup>

High glycemia in elderly hypertensive patients shows a dangerous relationship, as it influences lean mass, which in low percentages in women, is linked to a higher rate of hypertension, as well as the resulting pathophysiological changes, such as increased glucose concentration, insulin resistance, high blood pressure levels and, to this end, is independent of fat mass.<sup>30</sup>

This was a characteristic factor among the hypertensive patients analyzed in this study, although weight and BMI (body

mass index) were not discussed among the variables. However, hypertensive patients with high total cholesterol had a higher quality of life than those with low total cholesterol and there is evidence that there is no association between low-density lipoprotein (LDL) cholesterol and mortality in people over the age of 60.<sup>27</sup>

This opposition can be explained by the fact that LDL in low concentrations increases predisposition to terminal illnesses, as it has been shown that, once bound to the microorganism, it inactivates its toxicity. In other words, total cholesterol is inversely proportional to mortality, as proven by 68,406 deaths from respiratory and gastrointestinal diseases, most of which are infectious. These diseases are not thought to be the cause of low total cholesterol levels, as 100,000 healthy people whose initial cholesterol was lower were found to be more frequently hospitalized for infectious diseases, meaning that the infection could not have lowered cholesterol without contact having occurred.<sup>28</sup>

It is likely that quality of life is related to the objectives, beliefs and concerns of human beings in relation to the way they live. A subjective and multidimensional concept, it can contain both negative and positive elements. Certainly, people adapt and learn to live with their illnesses, with a subjective reduction in severity and impact on quality of life.<sup>30</sup>

The study's limitations were that it was cross-sectional and had a small non-probabilistic sample; it is believed that a longitudinal study with a larger number of participants could provide more conclusive results.

In addition, it is worth highlighting the research team's difficulty in using telephone contact for data collection, as attempts were made to contact the 160 hypertensive patients being treated at the outpatient clinic, however, difficulties were encountered due to the hospital registry being constantly out of date or the call not being answered, and most of the time, the numbers were deactivated by the operator, according to the answering message.

## CONCLUSION

We identified the profile of the sample and the association between self-reported pain and the quality of life of resistant hypertensive patients in the context of the Covid-19 pandemic.

It should be noted that in the post-pandemic context, it is necessary to continue scientific research into hypertension or other chronic diseases with an interest in the report, perception and impact of pain, both on quality of life and also with a view to improving health care practices.

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