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## HYPERTENSIVE OLDER ADULTS WHO EXERCISE IN THIRD AGE GYMS HAVE LOW LEVELS OF STRESS AND ANXIETY

### ABSTRACT

This study compared stress and anxiety symptoms in hypertensive older adults based on their sociodemographic profile and physical activity level. A cross-sectional study was conducted with 79 older adults attending Third Age Gyms in Maringá/PR. The Perceived Stress Scale, Geriatric Anxiety Inventory, and International Physical Activity Questionnaire (IPAQ) were applied. Data were analyzed using the Kolmogorov-Smirnov, Mann-Whitney "U," and Kruskal-Wallis tests ($p < 0.05$). Participants had low perceived stress (Md = 18.0) and anxiety (Md = 7.0) scores. No significant differences were found in stress and anxiety symptoms based on sociodemographic characteristics or physical activity levels. The findings suggest that hypertensive older adults engaging in physical exercise in Third Age Gyms experience low levels of stress and anxiety, regardless of their sociodemographic profile and physical activity level.

**Keywords**: aging; motor activity; exercise; hypertension; psychological stress.

## IDOSOS HIPERTENSOS PRATICANTES DE EXERCÍCIOS NAS ACADEMIAS DA TERCEIRA IDADE POSSUEM BAIXOS NÍVEIS DE ESTRESSE E ANSIEDADE

### RESUMO

Este estudo comparou os sintomas de estresse e ansiedade em idosos hipertensos com base em seu perfil sociodemográfico e nível de atividade física. Foi realizado um estudo transversal com 79 idosos frequentadores das Academias da Terceira Idade em Maringá/PR. Aplicaram-se a Escala de Estresse Percebido, o Inventário Geriátrico de Ansiedade e o Questionário Internacional de Atividade Física (IPAQ). Os dados foram analisados pelos testes de Kolmogorov-Smirnov, Mann-Whitney "U" e Kruskal-Wallis ($p < 0,05$). Os participantes apresentaram baixos escores de estresse percebido (Md = 18,0) e ansiedade (Md = 7,0). Não foram encontradas diferenças significativas nos sintomas de estresse e ansiedade em relação ao perfil sociodemográfico ou nível de atividade física. Os achados sugerem que idosos hipertensos que praticam exercícios nas Academias da Terceira Idade apresentam baixos níveis de estresse e ansiedade, independentemente de variáveis sociodemográficas e nível de atividade física.

**Palavras-Chave**: envelhecimento; atividade motora; exercício; hipertensão; estresse psicológico.

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## INTRODUCTION

Aging is considered a continuous and natural process of life in which gradual and natural changes occur. Organic functions begin to decline gradually, including physical, psychological, and social aspects, which are experienced differently by each individual (FERREIRA et al., 2022). In the physical domain, various capacities, such as flexibility, muscle strength, and balance, may be reduced. Social roles are lost after retirement or leaving the workforce, dependence, and social isolation in the social domain. In the psychological domain, in turn, there may be an increase in anxiety, depressive symptoms, and a lower perception of quality of life, leading to a negative impact on the older adult's life (SILVA JÚNIOR; EUDÁLIO, 2022). These and other various changes and events in the lives of older adults, especially those with chronic diseases such as heart disease, diabetes, respiratory disorders, and hypertension, cause concerns and increase stress and anxiety levels (LI; BRESSINGTON, 2019).

Stress and anxiety symptoms in older adults are often ignored, leading to worsening conditions and delayed intervention, which can result in a decline in the cognitive, behavioral, and social aspects of these individuals. It is worth noting that anxiety is one of the most common mental health problems in the older population and a risk factor for developing depression (LI; BRESSINGTON, 2019). Anxiety disorder is directly linked to excessive fear. It may manifest in different forms, such as generalized anxiety disorder (GAD), panic disorder, social anxiety disorder, and phobias, significantly impacting the lives of individuals with these disorders and causing severe harm to their quality of life (MICHAELIDES; ZIS, 2019). On the other hand, stress directly influences the aging of the immune system, accelerates biopsychosocial aging, and contributes to age-related tissue dysfunctions. Chronic stress reduces the body's ability to recover from any stress and, combined with adverse life events, leads to physical and emotional health impairments in older adults (FELSTED, 2020).

Furthermore, aging increases the risk of developing non-communicable chronic diseases (NCDs) (DIAS; PORTO; ANDRADE, 2022), with hypertension being the most prevalent. Oliveros et al. (2020) reinforce that the increasing number of older adults with hypertension is related to the prevalence of obesity and the emergence of cardiovascular diseases such as heart failure, stroke, and acute myocardial infarction, among others.

The relationship between hypertension and the perception of stress and anxiety in older adults is complex and multifaceted. Several factors contribute to hypertensive older adults having a worse perception of stress and anxiety compared to non-hypertensive older adults. 1) Hypertension can affect the functioning of the cardiovascular and nervous systems, making older adults more sensitive to blood pressure fluctuations, which can reflect a higher perception of stress and anxiety (BARROSO et al., 2020). 2) Hypertensive older adults often have other medical conditions, such as diabetes, heart disease, and kidney disease. The presence of multiple comorbidities can increase health-related concerns, leading to a heightened perception of stress and anxiety (MARQUES et al., 2020). 3) Many hypertensive older adults are undergoing treatment with antihypertensive medications, some of which may have side effects that affect mood, such as fatigue, drowsiness, and depression. This can contribute to a more excellent perception of stress and anxiety (SANTIMARIA et al., 2019). 4) Being aware of their hypertensive condition may lead older adults to additional concerns about their health. They may worry about the long-term effects of hypertension and the risk of cardiovascular complications, which can increase their perception of stress and anxiety (BENTO; MAMBRINI; PEIXOTO, 2020). 5) Hypertensive older adults, especially those with comorbidities, may be advised to isolate themselves, particularly during health-risk situations socially. Social isolation can increase the risk of loneliness and depression, contributing to the perception of stress and anxiety (MORAIS; REIS; SILVA, 2022).

In hypertensive older adults with low levels of physical fitness, in particular, anxiety and stress are directly associated with low quality of life, decreased cognitive functionality, severe muscle decline, and a reduction in the ability to perform activities of daily living (ADL) (FIGUEIRA et al., 2023). Thus, physical activity is a protective factor against stress and anxiety, as it improves or preserves functional capacity, balance, and cardiorespiratory function, among other benefits (Eckstrom et al., 2020). Hypertension can limit older adults' ability to engage in physical activities, which, in turn, can affect their emotional well-being. Regular physical activity is known to help reduce stress and anxiety (FROST et al., 2020).

Given this, hypertension and mental health problems such as stress and anxiety are significant public health issues worldwide. Understanding how these factors relate to older adults can provide valuable insights for developing prevention and intervention strategies. Additionally, stress and anxiety can significantly reduce the quality of life of hypertensive older adults. Identifying sociodemographic factors and physical activity levels that influence these symptoms can help develop targeted interventions to improve the quality of life of these individuals. Thus, this study aimed to compare stress and anxiety symptoms in hypertensive older adults based on sociodemographic profiles and physical activity levels.

## METHODS

This is a quantitative, analytical, observational, and cross-sectional study, approved by the Research Ethics Committee of Metropolitan College of Maringá (Unifamma), under opinion No. 2.190.425.

### *Participants*

This research's sample consisted of 79 older adults (67.2±6.48 years) who attended the Third Age Gyms (TAG) in Maringá/PR, selected intentionally and for convenience.

Among the 54 ATIs distributed across the city's four regions (north, south, east, west), 12 were randomly selected to participate in the study, with three from each region (north, south, east, west).

The inclusion criteria consisted  folder adults (60 years or older) of both sexes with a medical diagnosis of hypertension (HAS), according to their self-report. Older adults with possible cognitive impairment, assessed using the Mini-Mental State Examination (MMSE) (BRUCKI et al., 2003), were excluded. Five participants were excluded.

### *Instruments*

To identify the sociodemographic and health profile, a semi-structured questionnaire was developed with questions regarding sex, age, race, education level, smoking status, retirement, occupational status, monthly income, marital status, comorbidities, history of falls in the last six months, self-perceived health, duration of hypertension, duration of TAG attendance, weekly frequency of TAG attendance, use of hypertension medication, duration of medication use (if applicable), impact of hypertension on daily life, frequency of medical consultations with a cardiologist or healthcare professional responsible for hypertension treatment, and the last medical visit.

The Perceived Stress Scale (PSS) assessed perceived stress, consisting of 14 questions with response options ranging from zero to four (0 = never; 1 = almost never; 2 = sometimes; 3 = almost always; 4 = always). The positively worded questions (4, 5, 6, 7, 9, 10, and 13) have their scores reversed before summation: 0 = 4, 1 = 3, 2 = 2, 3 = 1, and 4 = 0. The other questions are scored directly. The total scale score is the sum of these 14 items, with scores ranging from zero to 56 (LUFT et al., 2007).

The Geriatric Anxiety Inventory (GAI) was used to evaluate anxiety. The GAI is a brief instrument for assessing anxiety in the older population. It consists of 20 questions in which participants agree or disagree. Each agreement counts as one point, and a score of 10 or higher indicates anxiety (MARTINY et al., 2011).

Older adults' physical activity level was assessed using the short version of the International Physical Activity Questionnaire (IPAQ). This instrument evaluates physical activities performed during leisure time, commuting, household tasks, and occupational activities. One hundred fifty minutes of weekly physical activity was considered the threshold for classifying participants as physically active; those performing less than 10 minutes per week were classified as sedentary, while those engaging in at least 10 minutes but not reaching 150 minutes were classified as insufficiently active. Sedentary behavior was evaluated based on the time spent sitting on weekdays and weekends (MATSUDO et al., 2001).

### *Procedures*

Initially, contact was made with the person responsible for the TAG in Maringá-PR to obtain authorization to conduct the study. Older adults who reported having hypertension were approached and selected. Those who agreed to participate signed the informed onsente form, while those unable to sign provided a fingerprint on the document.

### *Data Analysis*

Frequency and percentage were used for categorical variables in data analysis. For numerical variables, data normality was first verified using the Kolmogorov-Smirnov test. Since the data did not present a normal distribution, the Median (Md) and Quartiles (Q1; Q3) were used to measure central tendency and dispersion. To compare stress and anxiety symptoms based on sociodemographic variables and physical activity level, the Mann-Whitney "U" test (for two groups) and the Kruskal-Wallis test (for more than two groups) were applied. A significance level of $p < 0.05$ was considered.

## RESULTS

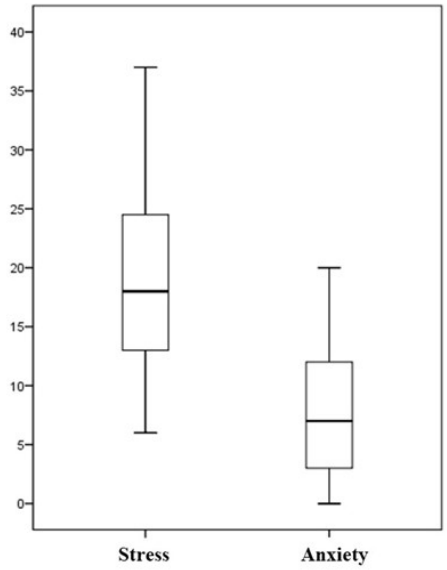
According to the data in Table 1, there is a predominance of older adults aged between 60 and 69 years (64.6%), female (84.8%), white (78.5%), retired (60.8%), with inactive occupational status (78.5%), a monthly income between one and two minimum wages (69.6%), and living with a partner (55.7%). It was found that 49.4% of the older adults had incomplete elementary education, 22.7% had completed elementary education, 20.3% had completed high school, and 7.6% had no formal education. Finally, 82.3% of the older adults were classified as very active/active in terms of physical activity level.

**Table 1. Sociodemographic Profile and Physical Activity Level of Older Adults in the Municipality of Maringá, Paraná, Brazil.**

| VARIABLES | *F* | % |
|---|---|---|
| **Age group** | | |
| 60 to 69 years | 51 | 64.6 |
| 70 years or more | 28 | 35.4 |
| **Gender** | | |
| Male | 12 | 15.2 |
| Female | 67 | 84.8 |
| **Education level** | | |
| No formal education | 6 | 7.6 |
| Incomplete elementary education | 39 | 49.4 |
| Complete elementary education | 18 | 22.7 |
| Complete high school | 16 | 20.3 |
| **Retirement** | | |
| No | 31 | 39.2 |
| Yes | 48 | 60.8 |
| **Occupational status** | | |
| Active | 17 | 21.5 |
| Inactive | 62 | 78.5 |
| **Incomes** | | |
| Less than one minimum wage | 8 | 10.1 |
| Between 1 and 2 minimum wages | 55 | 69.6 |
| More than two minimum wages | 16 | 20.3 |
| **Marital status** | | |
| With a partner | 44 | 55.7 |
| Without a partner | 35 | 44.3 |
| **Physical activity level** | | |
| Very active/active | 65 | 82.3 |
| Irregularly active | 14 | 17.7 |

Figure 1 presents the descriptive analysis of stress and anxiety symptoms in hypertensive older adults. Overall, the older adults exhibited low scores for both stress (Md = 18.0; Q1 = 13.0; Q3 = 25) and anxiety (Md = 7.0; Q1 = 3.0; Q3 = 12.0).

**Figure 1. Descriptive analysis of stress and anxiety symptoms in hypertensive older adults attending the Third Age Gyms in the municipality of Maringá, PR.**




When comparing stress and anxiety symptoms in hypertensive older adults based on their sociodemographic profile (Table 2), no significant difference was found (p > 0.05) between the groups for either anxiety or stress symptoms.

**Table 2. Comparison of stress and anxiety symptoms in hypertensive older adults attending the Third Age Gyms in the municipality of Maringá, PR, based on sociodemographic profile.**

| GRUPOS | Stress Md (Q1-Q3) | p | Anxiety Md (Q1-Q3) | P |
|---|---|---|---|---|
| **Age group** | | | | |
| 60 to 69 years | 14.00 (9.00-20.75) | 0.134 | 3.50 (0.25-9.50) | 0.127 |
| 70 years or more | 18.00 (13.00-26.00) | | 7.00 (3.00-12.00) | |
| **Gender** | | | | |
| Male | 18.00 (13.00-24.00) | 0.898 | 7.00 (3.00-13.00) | 0.604 |
| Female | 18.00 (12.25-25.75) | | 7.50 (1.50-11.00) | |
| **Marital status** | | | | |
| With a partner | 18.00 (12.00-22.75) | 0.297 | 7.50 (3.00-12.00) | 0.902 |
| Without a partner | 18.00 (13.00-27.00) | | 7.00 (3.00-13.00) | |
| **Incomes** | | | | |
| Less than 1 MW | 17.00 (14.50-26.75) | | 6.00 (1.50-16.25) | |
| Between 1 and 2 MW | 18.00 (12.00-26.00) | 0.962 | 8.00 (3.00-13.00) | 0.412 |
| More than 2 MW | 18.50 (12.50-22.00) | | 5.50 (1.00-9.75) | |
| **Education level** | | | | |
| No formal education | 18.00 (10.75-29.00) | | 6.50 (0.75-11.00) | |
| Incomplete e. ed. | 18.00 (12.00-25.00) | 0.830 | 8.00 (3.00-13.00) | 0.093 |
| Complete e. ed. | 15.00 (12.00-18.50) | | 6.50 (2.50-12.00) | |
| Complete high school | 21.50 (18.00-31.00) | | 6.50 (2.25-13.00) | |
| **Occupational status** | | | | |
| Active | 18.00 (15.00-22.00) | | 6.00 (2.00-7.50) | |
| Inactive | 18.00 (12.00-26.00) | | 8.00 (3.00-13.00) | |
| **Retirement** | | | | |
| Yes | 17.50 (12.25-23.00) | 0.395 | 7.00 (2.25-10.00) | 0.163 |
| No | 19.00 (14.00-26.00) | | 7.00 (4.00-15.00) | |

***Significant difference - p<0.05 (Mann-Whitney "U" test for two groups and Kruskal-Wallis test for more than two groups). e.ed.: elementary education. MW: minimum wage(s).**

When comparing stress and anxiety symptoms based on the level of physical activity (Table 3), no significant difference was found between the groups, indicating that the level of physical activity does not appear to be an intervening factor in the stress and anxiety symptoms of hypertensive older adults.

**Tabela 3. Comparação dos sintomas de estresse e ansiedade idosos hipertensos frequentadores das academias da terceira idade do município de Maringá, PR, em função do nível de atividade física.**

| VARIABLES | Physical activity level | | *P* |
|---|---|---|---|
| | Very active/active | Irregularly active | |
| | Md (Q1-Q3) | Md (Q1-Q3) | |
| Stress | 18.00 (13.00-24.50) | 16.00 (7.75-35.00) | 0.456 |
| Anxiety | 7.00 (3.00-11.50) | 8.00 (2.50-13.00) | 0.657 |

***Significant difference - p<0.05 (Mann-Whitney "U" test)**

## DISCUSSION

The main results of the study indicate that, in general, older adults exhibited low levels of perceived stress and anxiety; sociodemographic profile and physical activity level do not appear to be intervening factors in the stress and anxiety symptoms of hypertensive older adults.

The fact that hypertensive older adults have low levels of perceived stress and anxiety can be explained by a variety of factors. It is important to note that each older adult is unique, and therefore, the justifications may vary from one individual to another. With aging, many older adults may have accumulated extensive life experience, allowing them to cope with stress more effectively. Over the years, they may have learned to manage stressful situations and developed coping strategies. Some older adults may be more resilient to stress, meaning they can better adapt to adversity and maintain emotional balance. Resilience is a trait that can be strengthened throughout life (BUFORD, 2016).

It is worth highlighting that older adults frequently have social support networks, such as family, friends, and support groups, which play an important role in reducing stress and anxiety. Social support can provide a sense of belonging and emotional security (GALLARDO-PERALTA et al., 2023). Additionally, the hypertensive older adults evaluated may have adopted a healthy lifestyle, including a balanced diet, adequate sleep (which were not assessed), and regular physical exercise at the ATIs. These factors can help reduce stress and anxiety (FRIEDMAN, 2020).

When comparing stress and anxiety symptoms in hypertensive older adults based on their sociodemographic profile, no significant difference was found between groups. This finding may be justified because many study participants are retired and live on a stable income. Consequently, the levels of anxiety and stress—often linked to financial and economic concerns—are low. It is worth noting that older adults with a family income of two to three minimum wages tend to have a positive self-perception of health (BRASIL et al., 2021). On the other hand, a study by Thapa et al. (2020) observed that retired older adults exhibited higher stress levels due to the loss of professional identity.

Most of the older adults in the present study had low educational levels. This may result in less information and knowledge about the risks and consequences of hypertension itself, leading to lower concern, stress, and anxiety. Older adults with five or more years of schooling tend to have a positive self-perception of health (BRASIL et al., 2021), which may be reflected in lower stress and anxiety levels. Moreover, most of the evaluated older adults live with a partner, which supposedly provides a sense of care, security, physical, emotional, social, and financial support, consequently reducing stress and anxiety levels. Loneliness is a significant predictor of mortality in old age, as well as a risk factor for clinical complications, making it a serious health concern (POLLAK; VERGHESE; BLUMEN, 2023).

Other external factors, unrelated to the sociodemographic profile, may significantly contribute to the low stress and anxiety levels observed in the participants. For example, the quality of the gym environment, social support within the exercise group, personal motivation, and trainer instruction may influence stress and anxiety levels.

We found that physically active/very active and irregularly active older adults had similarly low perceived stress and anxiety levels. Leger et al. (2023) state that physically active older adults tend

to have lower levels of perceived stress. However, little is known about the links between physical activity and exposure to or reactivity to stressful life events. Regardless of its level, physical activity appears to enhance older adults' ability to manage affective responses to stressors more successfully (LEGER et al., 2023). Meanwhile, a study by Oliveira et al. (2019) showed that sedentary older adults had higher anxiety scores.

This lack of association between physical activity level and stress and anxiety symptoms in hypertensive older adults attending the TAG can be explained by several factors. The effects of physical activity on stress and anxiety reduction may vary significantly among individuals. Some older adults may respond positively to increased physical activity, experiencing reduced stress and anxiety symptoms, while others may not perceive the same benefits. Individual responses to physical activity may be influenced by genetic factors, psychological predisposition, and others (FIGUEIRA et al., 2023). The type and intensity of physical activity may also play a crucial role. If older adults primarily engage in low-intensity activities or exercises that do not incorporate relaxation or meditation elements, stress and anxiety reduction benefits may be less pronounced (ECKSTROM et al., 2020). Additionally, frequency and consistency of physical activity are essential for reaping mental health benefits. If older adults exercise sporadically or irregularly, the effects on stress and anxiety reduction may be limited (AN et al., 2020).

It is important to highlight that a range of other lifestyle factors, such as sleep quality, diet, alcohol and tobacco consumption, and social support can influence stress and anxiety symptoms. If these factors are not controlled or considered, they may mask the effects of physical activity. Furthermore, in addition to hypertension, older adults may have other health conditions that impact stress and anxiety symptoms. If these conditions are not considered in the analysis, the effects of physical activity may be obscured (DIAZ; SHIMBO, 2013).

Despite the important findings presented, this study has some limitations:

a) Cross-sectional studies do not establish cause-and-effect relationships since data is collected simultaneously. Therefore, it is not possible to determine whether sociodemographic profile or physical activity level causes stress and anxiety symptoms or if other variables influence these symptoms.
b) The study sample does not represent the general population of hypertensive older adults.
c) Data was collected through self-reports, which may introduce information biases. Participants may not accurately report their sociodemographic profile, physical activity level, or stress and anxiety symptoms.
d) A cross-sectional study does not allow for assessing changes over time. Stress and anxiety symptoms may fluctuate, and physical activity levels may also vary.
e) Other variables not considered in the analysis may affect the results. For instance, factors such as antihypertensive medications, recent life events, social support, and others may influence stress and anxiety symptoms.

## CONCLUSION

Based on the presented results, it is concluded that hypertensive older adults who engage in physical exercise at the TAG in the city of Maringá, Paraná, exhibited low levels of perceived stress and anxiety. The sociodemographic profile and physical activity level do not appear to be factors that impact the stress and anxiety symptoms of these older adults.

The results suggest that regular physical exercise at TAG may be beneficial in reducing stress and anxiety symptoms in hypertensive older adults. This implies that health authorities and institutions responsible for the older adults should consider promoting and encouraging specific exercise programs for this group. Exercise programs at TAG can be designed inclusively, encompassing a wide range of demographic characteristics to ensure that all hypertensive older adults can benefit. Additionally, these programs should be diverse and tailored to the needs of hypertensive older adults, with proper guidance and regular monitoring to ensure that exercises are performed safely and effectively.

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