Use of Antidepressants and Risk of Falls in Active Women Aged 50 and Over

Uso de Antidepressivos e Risco de Quedas em Mulheres Ativas com 50 Anos ou Mais

Uso de Antidepresivos y Riesgo de Caídas en Mujeres Activas de 50 Años o Más

RESUMO

Objetivo: avaliar a influência de capacidades físicas e cognitivas no risco de quedas em mulheres fisicamente independentes com 50 anos ou mais. **Métodos:** a amostra incluiu 255 participantes (63,5 ± 6,3 anos) do Programa de Exercício Físico para Idosos da Escola de Educação Física e Esporte de Ribeirão Preto (USP). Foram analisadas variáveis como idade, escolaridade, uso de medicamentos (incluindo antidepressivos), presença de doenças crônicas, nível de atividade física, força muscular, flexibilidade, agilidade, capacidade aeróbia, desempenho cognitivo e sintomas depressivos e ansiosos. Realizou-se uma regressão logística (stepwise). **Resultados:** o único fator significativamente associado ao risco de quedas foi o uso de medicamentos para depressão (OR = 4,32; IC95% 1,65 – 11,30; p = 0,042), o que pode ser explicado pelos seus efeitos colaterais. **Conclusão:** é importante ter monitoramento rigoroso da saúde mental, por meio de um trabalho multi e interdisciplinar, prevenindo quedas e promovendo fortalecimento físico, estabilidade emocional e bem-estar psicossocial.

DESCRITORES: Envelhecimento; Antidepressivos; Saúde mental; Qualidade de vida.

ABSTRACT

Objective: to evaluate the influence of physical and cognitive abilities on the risk of falls in physically independent women aged 50 years or older. **Methods:** the sample included 255 participants (63.5 ± 6.3 years) of the Physical Exercise Program for the Elderly of the Escola de Educação Física e Esporte de Ribeirão Preto (USP). Variables such as age, education, medications (including antidepressants), presence of chronic diseases, level of physical activity, muscle strength, flexibility, agility, aerobic capacity, cognitive performance, and symptoms of depression and anxiety were analyzed. A logistic regression (stepwise) was performed. **Results:** the only factor significantly associated with the risk of falls was the use of medications for depression (OR = 4.32; 95%CI 1.65 – 11.30; p = 0.042), which can be explained by their side effects. **Conclusion:** it is important to have strict monitoring of mental health, through multi and interdisciplinary work, preventing falls and promoting physical strengthening, emotional stability and psychosocial well-being.

DESCRIPTORS: Aging; Antidepressants; Mental health; Quality of life.

RESUMÉN

Objetivo: evaluar la influencia de las capacidades físicas y cognitivas en el riesgo de caídas en mujeres físicamente independientes de 50 años o más. **Métodos:** la muestra incluyó 255 participantes (63,5 ± 6,3 años) del Programa de Ejercicio Físico para Ancianos de la Escuela de Educación Física y Deportes de Ribeirão Preto (USP). Se analizaron variables como edad, escolaridad, uso de medicación (incluidos antidepresivos), presencia de enfermedades crónicas, nivel de actividad física, fuerza muscular, flexibilidad, agilidad, capacidad aeróbica, rendimiento cognitivo y síntomas depresivos y ansiosos. Se realizó una regresión logística (paso a paso). **Resultados:** el único factor asociado significativamente al riesgo de caídas fue el uso de medicamentos para la depresión (OR = 4,32; IC95% 1,65 – 11,30; p = 0,042), lo que puede explicarse por sus efectos secundarios. **Conclusión:** es importante tener un seguimiento estricto de la salud mental, mediante el trabajo multi e interdisciplinario, previniendo caídas y promoviendo el fortalecimiento físico, la estabilidad emocional y el bienestar psicosocial.

DESCRIPTORES: Envejecimiento; Antidepresivos; Salud mental; Calidad de vida.

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INTRODUCTION

Population aging is a global reality. According to the World Health Organization [1] It is estimated that by 2060, the world population aged 60 or over will reach 2 billion people, a significant increase compared to the 900 million recorded in 2015. In Brazil, this age group already exceeds 28 million people, corresponding to 13% of the total population, with a tendency to double in the coming decades. [2] This scenario directly impacts the socioeconomic and health conditions of the population, in addition to imposing challenges on the health system. [3]

Aging is a dynamic and progressive process, characterized by morphological, functional, biochemical and psychological changes, which reduce the individual's ability to adapt to the environment, making them more vulnerable to diseases and adverse events. [4] Among the most notable changes in this process, we highlight the functional degradation of the musculoskeletal and central nervous systems, compromising motor performance and increasing the risk of falls. [5,6] Sarcopenia, a condition characterized by the loss of muscle mass and strength associated with aging, is one of the main factors involved in postural instability and the inability to respond adequately to balance disturbances. [6]

Falls are common events in the elderly population and represent a serious public health problem due to their consequences, which include fractures, hospitalizations, institutionalization, increased mortality and significant psychosocial damage. [7,8,9,10] Between 2002 and 2016, the Unified Health System (SUS) allocated more than one billion reais to the treatment of femur fractures in the elderly, highlighting the economic impact of this condition. [10]

Several factors contribute to the occurrence of falls, which can be classified as intrinsic (related to the individual's health status, such as sarcopenia and cognitive deficits) or extrinsic (related to the environment, such as uneven floors). [11] Furthermore, studies indicate that falls are associated with variables such as advanced age, female sex, polypharmacy, depression, cognitive impairment and musculoskeletal conditions. [10,12]

Notably, female gender is a relevant risk factor, since elderly women are more fragile, have less muscle mass and a higher prevalence of chronic diseases, such as osteoporosis and obesity. [11,13] Despite the higher incidence of falls among elderly women, the literature lacks in-depth investigations into the mechanisms underlying this vulnerability, especially in active and independent elderly women.

In this context, the present study aims to analyze the influence of physical and cognitive capacities on the risk of falls in independent women aged 50 years or older, considering variables such as age, educational level, use of medications, presence of chronic diseases, level of physical activity, muscle strength, flexibility, agility, aerobic capacity, cognitive performance, and symptoms of depression and anxiety.

METHODS

This study was approved by the Human Research Ethics Committee of the School of Physical Education and Sports of Ribeirão Preto, University of São Paulo (EEFERP-USP; CAAE: 63681517.3.0000.5659). All participants signed the Free and Informed Consent Form (FICF), guaranteeing voluntary participation in the study and compliance with ethical principles.

This is a cross-sectional quantitative study, the objective of which was to evaluate the influence of physical

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and cognitive variables on the risk of falls in physically independent women, aged 50 or over, participating in the Physical Exercise Program for the Elderly (PEPE). This program offers multicomponent physical training for elderly residents of the city of Ribeirão Preto (SP) and has the support of research funding institutions.

Participants

Participants were selected through extensive publicity of the PEFI, using local media outlets (TV, radio, social media and emails sent to the community of the University of São Paulo, Ribeirão Preto campus). Inclusion and exclusion criteria were established to ensure sample homogeneity and minimize confounding factors:

- Inclusion criteria: age between 50 and 79 years, functional independence and participation in PEFI.
- Exclusion criteria: diagnosis of uncontrolled mental illness or neurological disorder, presence of untreated systemic diseases, motor deficits that prevent physical assessments and uncorrected auditory or visual deficits that compromise the application of cognitive tests.

Instruments and tests applied

- Clinical and sociodemographic profile: structured questionnaire covering age, marital status, occupation, history of illnesses and use of medications.
- History of falls: specific questionnaire, including number of falls, consequences and circumstances involved.
- Depression: use of antidepressant medications (identification via anamnesis) and Geriatric Depression Scale, short version (GDS-15). [14,15].
- Anxiety: Beck Anxiety Inventory (BAI). [16,17]
- Cognitive performance: Montreal Cognitive Assessment (MoCA). (18,19)
- Physical activity level: Modified Baecke Questionnaire for Elderly (MBQE). [20, 21]
- Muscular strength: Lower limbs: "Sit-to-Stand" test – number of repetitions in 30 seconds. [22] Upper limbs: "Elbow Flexion and Extension" test – number of repetitions in 30 seconds, using a 2.27 kg dumbbell for women. [22]

Aerobic capacity: Six-Minute Walk Test – distance covered on a 4.57m x 18.28m course. [22]

- Flexibility: "reaching behind the back" – measurement of the distance between the fingers when trying to touch oneself behind the back. "Sit and Reach" - measurement of the distance between the hands and feet when trying to reach them while sitting. [23]
- Agility: Osness et al. Test [24] - time needed to get up from the chair, go around a cone 1.5 m behind and 1.8 m to the side of the chair, and return to the starting position.

Procedures

Data collection was carried out at EEFERP-USP facilities, conducted by previously trained professionals, ensuring the standardization and reliability of the assessments. The following independent variables were analyzed:

- Sociodemographic and clinical profile: age, years of education, use of continuous medication (including antidepressants), presence of chronic diseases (diabetes and high blood pressure).
- Physical factors: level of physical activity, muscle strength, flexibility, agility, aerobic capacity.
- Psychological and cognitive factors: cognitive performance, depressive and anxiety symptoms.

The dependent variable was the occurrence of falls in the last 12 months (binary answer: "yes" or "no").

Data analysis

The data were entered into a double-entry database in Excel software and analyzed in R software (version 3.5.3). The normality of the variables was verified by the Shapiro-Wilk test. To assess the association between falls and possible risk factors, a logistic regression model was used using the stepwise method, considering the occurrence of falls in the last 12 months ("yes" or "no") as the dependent variable. The association between falls and categorical variables was analyzed using the chi-square test. The significance level adopted was 5% ($p \leq 0.05$).

RESULTS

The final study sample consisted of 255 physically independent women (n = 255), with a mean age of 63.5 years (SD = ±6.3 years) and a mean of 10.5 years of schooling (SD = ±4.3 years). Among the participants, 32% (n = 82) reported having suffered one or more falls in the last year. In addition, 83.1% (n = 212) had a diagnosed disease, and 83.5% (n = 213) were continuously using one or more medications (Table 1).

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Table 1 - General characteristics of the sample (n=255)

	Position and dispersion measures	
	Mean (years)	Standard Deviation
Age	63.5	±6.3
Years of study	10.5	±4.3
	No. of participants	Percentage (%)
Falls in the last year	82	32.1
Diseases	212	83.1
Medications	213	83.5

Analysis of the association between falls and predictor variables

After logistic regression analysis, none of the variables related to physical capacity, age, years of education, continuous medication use, disease diagnosis, diabetes, arterial hypertension, physical activity level, cognitive performance, depressive symptoms (GDS) and anxiety symptoms (BAI) showed a significant association with the risk of falls. However, the use of medication for depression was identified as a significant predictor, being associated with a higher risk of falls in the last year (OR = 4.32; 95% CI: 1.65 – 11.30; p = 0.042). Tables 2 and 3 show the comparison of continuous and categorical variables between women who suffered falls and those who did not suffer falls in the last year.

Table 2 - Continuous variables in relation to falls in the last year (n=255).

	Falls	
	Yes	No
Age (years)	63.5±6.4	63.5±6.4
Years of study (years)	10.6±4.2	10.6±4.3
Total MBQE (points)	6.5±4.8	6.4±4.8
MoCA (points)	20.7±3.7	20.8±3.7
Elbow Flexion and Extension (rept)	15.5±4.5	15.6±4.5
Sit and Stand (rept)	12.9±3.8	13.1±3.9
Sit and Reach (cm)	0.6±9.1	0.6±9.2
Reach Behind Back (cm)	-6.3±10.0	-6.1±10.0
Agility (sec)	25.4±4.0	25.3±4.0
6-Minute Walk (m)	530.8±70.6	531.6±70.2

Rept: repetições.

Table 3 - Categorical variables in relation to falls in the last year (n=255).

	Falls		
	Yes	No	p-value
Diseases			
Yes	68	143	0.998
No	14	30	
Diabetes			
Yes	17	32	0.800
No	65	141	
Hypertension			
Yes	36	80	0.829
No	46	93	

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Medication for continuous use			0.634
Yes	70	142	
No	12	31	
Depression Medication			0.042*
Yes	11	9	
No	71	164	
Geriatric Depression Scale (GDS)			0.988
Yes	16	35	
No	66	138	
Anxiety (BAI)			0.961
Yes	18	40	
No	64	133	

Analyses performed using Chi-square. *statistically significant value.

Profile of participants using medication for depression

Among participants who used antidepressant medications, the majority used selective serotonin reuptake inhibitors (54.2%), followed by benzodiazepines (16.9%) and tricyclic antidepressants (15.2%).

DISCUSSION

The aim of this study was to assess the influence of physical, psychological and demographic variables on the risk of falls in physically independent women aged 50 or over. Among the variables analyzed - age, years of education, use of continuous medication, use of medication for depression, diagnosis of diseases, diabetes, high blood pressure, level of physical activity, muscle strength, flexibility, agility, aerobic capacity, cognitive performance, depressive and anxiety symptoms - only the use of medication for depression was identified as a significant risk factor for falls.

The findings of this study corroborate previous research indicating an association between the use of psychoactive medications and the risk of falls in the elderly. Chaimowicz, Ferreira and Miguel [25] (2000) observed that the use of benzodiazepines, anticonvulsants, tricyclic antidepressants and α-methyldopa is associated with an increased occurrence of falls in this population. Similarly, Coutinho and Silva [26] (2002) identified a higher incidence of falls with risk of serious fractures in elderly people who used calcium channel blockers and benzodiazepines. These findings support the relationship between the use of psychotropic drugs and falls, which can be explained by the adverse effects of these medications, such as sedation, dizziness, ataxia and postural hypotension, which compromise postural stability and motor coordination. [26,27]

The study by Santos, Moriguchi and Blank [28] (2018) also highlighted benzodiazepines, especially clonazepam and diazepam, as predisposing factors for falls, due to their association with psychomotor slowness, daytime sleepiness, and changes in gait and balance. In the present study, most participants who used medication for depression used selective serotonin reuptake inhibitors (54.2%), followed by benzodiazepines (16.9%) and tricyclic antidepressants (15.2%), which reinforces the influence of these substances in increasing the risk of falls.

Interestingly, the other variables analyzed did not show a significant association with the risk of falls, which diverges, in part, from the existing literature. The World Health Organization [29] lists multiple risk factors for falls, including advanced age, gender, health conditions, reduced mobility, medication use, and environmental factors. In addition, Pimentel et al. [10] (2018) indicate that falls are associated with advanced age, female gender, marital status, negative self-rated health, continuous use of medications, depression, hearing and vision impairment, chronic diseases, and environmental barriers.

The lack of a significant association between falls and factors such as age, level of physical activity, muscle strength, flexibility, agility, and cognitive performance can be explained, in part, by the sample size and its relative homogeneity. Pearson's chi-square test, used in the study, is more sensitive in larger samples, which may have reduced the ability to detect statistically significant associations.

It is important to highlight that a limitation of the present study was the use of an unbalanced sample, which may have impacted the results. However, a strength of the study was the focus on a population that has been little explored in the literature, consisting of physically independent women in the aging process. Given that falls are a problem of clinical and epidemiological relevance, we recommend that future studies use larger samples and longitudinal designs, allowing a more comprehensive assessment of risk factors. In addition, more detailed investigations into the influence of different classes of medications and their interactions with physical and cognitive variables may contribute to a better understanding of the mecha-

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nisms involved in the risk of falls.

In the context of fall prevention, it is essential to adopt an interdisciplinary approach, integrating professionals from Physical Education, Psychology, Physiotherapy, Geriatrics and other health areas. Strategies such as regular physical exercise, periodic assessments of functional and cognitive capacity, and continuous monitoring of fall history and medication use are essential to minimize risks and promote safer and more independent aging. In addition, integration between research and development must be continuous, ensuring that mental health interventions evolve to offer effective and safe treatments, considering both the benefits and possible adverse effects of medications. [30] In this way, advances in care for people over 50 years of age can be improved, allowing a more personalized and preventive approach, which positively impacts the quality of life and psychosocial adjustment of this population.

CONCLUSIONS

This study concluded that, among physically independent women aged 50 or over, the use of prescription drugs for depression represents a significant risk factor for falls. This association can be explained by the side effects of these drugs, which directly impact balance, motor coordination and psychomotor status.

In addition, the results reinforce the need for a multidisciplinary approach, considering not only physical and physiological aspects, but also the impacts of mental health and psychosocial adjustment on the risk of falls. Elderly women who use antidepressants may present greater emotional vulnerability, fear of falling and restriction of physical activities, which can compromise their quality of life and functional independence. Therefore, integrated preventive strategies should be encouraged, combining efforts of professionals in Physical Education, Psychology, Physiotherapy and Medicine to promote active and healthy aging.

Among the practical implications of this study, we highlight:

- Regular monitoring of mental health and medication use, especially psychotropic drugs, in older women.
- Interventions that combine physical exercise and psychological support strategies, aiming not only at muscle strengthening, but also at emotional balance and self-confidence.
- Creation of specific programs for fall prevention, including postural stability training, relaxation techniques and encouragement of emotional self-care.
- Promotion of social inclusion and psychosocial support, preventing isolation and its negative impacts on the functionality and self-esteem of elderly women.

Finally, we emphasize the importance of future research that deepens the relationship between mental health, antidepressant use and falls, exploring biopsychosocial strategies that can minimize these risks. Physical Education, together with Sports Psychology and other health areas, can play a fundamental role in creating interventions that promote safer, more active, happy and healthy aging.

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