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THE BENEFITS OF PHYSICAL EXERCISE FOR HEALTHY AGING

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ABSTRACT

The aim of this study was to investigate the benefits of physical exercise for healthy aging. The assessment of functional capacity levels was conducted using the Fullerton Battery. The sample consisted of 38 elderly women (33 in the case group and 5 in the control group), aged over 60. Improved performance was observed in various variables in the Case Group, including the sit and reach test (p=0.034), reach behind the back (p=0.046), walking test (p=0.002), and stationary march (p=0.027), compared to the Control Group. Elderly women who engage in regular physical exercise demonstrate better functional capacity, particularly in terms of flexibility and aerobic endurance.

Key words: Elderly. Aging. Physical Exercise.

RESUMO

Os benefícios do exercício físico para um envelhecimento saudável

O objetivo deste estudo consistiu em investigar os impactos positivos do exercício físico na promoção de um envelhecimento saudável. A avaliação da capacidade funcional foi conduzida por meio da aplicação da Bateria de Fullerton. A amostra abrangeu 38 idosas, das quais 33 pertenciam ao Grupo Caso e 5 ao Grupo Controle, todas do sexo feminino e com idade superior a 60 anos. Os resultados revelaram um desempenho significativamente superior no Grupo Caso em diversas variáveis, incluindo os testes de sentar e levantar (p=0,034), alcance atrás das costas (p=0,046), caminhada (p=0,002) e marcha estacionária (p=0,027), em comparação ao Grupo Controle. Este estudo demonstra que mulheres idosas que se engajam regularmente em exercícios físicos apresentam uma melhor capacidade funcional, especialmente nos aspectos relacionados à flexibilidade e resistência aeróbia, contribuindo assim para um envelhecimento mais saudável.

Palavras-chave: Idosos. Envelhecimento. Exercício Físico.

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INTRODUCTION

Aging can be understood as a continuous and dynamic process of biological, morphological and psychological changes that occur throughout human life. From a biological point of view, aging represents the degeneration of organic structures and functions (Naruse, Trappe, Trappe, 2023).

According to the World Health Organization (WHO, 2020), people aged 60 years and over are considered elderly.

In a projection for 2050, it is estimated that people in this age group represent around 20% of the world population, which is equivalent to approximately 2 billion inhabitants. In Brazil, according to the Brazilian Institute of Geography and Statistics (IBGE, 2021), the elderly population corresponds to around 14.7% of the population, having increased by 38.9% in the period from 2012 to 2021.

However, with the increase in the elderly population, there are some characteristics of aging that require special care, highlighting the progressive loss of functional and cognitive physical fitness. From the perspective of greater longevity and quality of life for the population, some conditions for improving these functions have been proposed in the literature (Naruse, Trappe, Trappe, 2023; Snih et al., 2005), such as engaging in regular physical exercise programs, which can contribute to the preservation of functional autonomy and assist in the prevention and control of chronic degenerative diseases.

Thus, the decline in functional capabilities resulting from aging is harmful to the health of the elderly, increasing the risk of comorbidities and generating functional incapacity. This results in an increased decline in functional capabilities, resulting from the senility process (Naruse, Trappe, Trappe, 2023), directly impacting activities of daily living (ADLs) and biopsychosocial aspects (Sin, Yaffe, Whooley, 2015).

Furthermore, reduced function increases the risk of falls and, as a consequence, fractures, becoming one of the main health problems of the elderly population (Castro et al., 2015), which can lead to morbidity and increasing the risk of mortality.

According to the WHO (2020), the reduction in muscle strength, balance, visual changes, changes in gait, cognitive deficits, adverse effects of medications and environmental, behavioral and social factors increase the decline in the health of the elderly.

Therefore, minimizing the effects of aging, especially the deficit in functional capabilities, involving balance and gait, becomes extremely important in reducing the risk of falls in the elderly, increasing independence in performing ADLs and, as a consequence, improving the quality of life and longevity of the elderly (Naruse, Trappe, Trappe, 2023).

Among the strategies used to minimize aging declines, physical exercise programs have proven to be one of the best resources, contributing to healthier aging, improving general levels of health-related physical fitness, leading to better execution of ADLs and reducing the risk of falls in the elderly (Karinkanta et al., 2015).

For any age group, especially the most advanced, a continuous physical exercise program promotes biopsychosocial benefits, contributing to healthier aging. Therefore, attending a regular physical exercise program is extremely important for the health of the elderly (Naruse, Trappe, Trappe, 2023; Castro et al., 2015; Karinkanta et al., 2015).

Therefore, the present study is based on the hypothesis that adherence to physical exercise promotes quality of life and, by encouraging its practice, becomes a resource for the prevention and control of chronic diseases, as well as the reduction of complications. of aging and increased longevity, improving the quality of life of the elderly. Therefore, the present study aims to verify the benefits of physical exercise for healthy aging.

MATERIALS AND METHODS

This is a cross-sectional, descriptive case-control study (Thomas, Nelson, Silverman, 2015). The research was approved by the Research Ethics Committee of the State University of Paraiba (number: 5.074.055; CAAE: 52347421.4.0000.5187), in accordance with the provisions of Resolution nº. 466/12 of the National Health Council. Data collection was carried out with the Fullerton Battery, developed by Rikli and Jones (2011), which evaluated the components associated with functional independence, comprising: reaching behind the back (flexibility of the upper limbs), reaching in a sitting position (flexibility of the lower limbs), walking stationary for two minutes (aerobic resistance), forearm flexion (upper limb

strength), standing up and sitting for 30 seconds (lower limb strength), going back and forth 2.44 m (agility and dynamic balance) and walking for 6 minutes (aerobic endurance).

Participants were invited to participate voluntarily, informed about the risks and benefits of the study and gave their consent by signing the informed consent form to participate in the research.

The criteria for participating in the study were: a) not having an illness that could compromise cardiovascular responses; b) not have joint limitations that would make it impossible to perform physical exercises; c) be a woman over the age of 60. The sample was divided into two groups: 1) Case Group, consisting of elderly women who were engaged in a physical exercise program, entitled Ginástica da Orla, for elderly people in the city of Olinda - PE, for at least three months. 2) Control Group, which had not practiced physical exercise for at least three months, including elderly women who attended the family health program in the Imbiribeira neighborhood, city of Recife - PE.

All participants performed the Fullerton Battery tests (Rikli, Jones, 2001) to verify differences in functional capabilities between elderly people who practice physical exercise and elderly people who do not.

Participants in the Case Group underwent a group training program, with classes held three times a week, lasting an average of 60 minutes. The classes were divided into three distinct parts: 1) warm-up, consisting of active stretching and joint mobilization exercises, lasting an average of ten minutes; 2) main part, with resistance exercises, using external weights and the body itself for upper, lower limbs and trunk, lasting an average of 40 minutes; 3) return to calm, with active stretching, lasting an average of ten minutes.

Participants in the Control Group were monitored in the family health program in the Imbiribeira neighborhood, in the city of Recife - PE, and participated in the program during a visit.

For data interpretation, descriptive analysis was used to characterize the sample, expressing the results as mean and standard deviation. Initially, an exploratory test indicated the non-existence of “outliers”. The normality test (Shapiro-Wilk) showed that the data were normal in all comparisons.

To verify differences between groups (case and control), the t test was used with heteroscedastic samples. All analyzes were performed using the Statistical Package for the Social Sciences - SPSS 17.0 software, with a previously established level of significance ($p < 0.05$).

RESULTS

A total of 38 participants were evaluated, all female, distributed into two groups (Case and Control).

The Case Group was made up of 33 elderly women who were part of the physical exercise program, while the Control Group was made up of five elderly women who did not practice physical exercise. The sample characteristics are described in Table 1.

Table 1 - Sample characterization.

Variable	Sample (n=38) Mean ± SD	Case Group (n=33) Mean ± SD	Control Group (n=5) Mean ± SD
Age (years)	66.65 ± 5.20	66.94 ± 5.48	64.80 ± 2.49
Height (cm)	156.06 ± 8.09	155.44 ± 7.75	154.80 ± 10.94
Body mass (kg)	67.90 ± 8.50	68.04 ± 8.12	71.76 ± 10.99

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Table 2 - Difference between the Fullerton Battery tests between the Case Group and the Control Group.

Variable	GCA (n=33) Mean ± SD	GCO (n=5) Mean ± SD	Difference Mean (%)	Value p
Sit and reach (cm)	5.62 ± 14.67	-5.00 ± 7.54	10.62 (67.99%)	0.034*
Behind the back (cm)	-5.83 ± 7.58	-25.20 ± 15.61	19.67 (77.15%)	0.046*
Sit and stand (repetitions)	13.58 ± 2.79	11.60 ± 2.97	1.98 (17.03%)	0.217
Elbow flexion (repetitions)	18.44 ± 1.71	15.00 ± 5.79	3.44 (18.66%)	0.258
Back and forth (seconds)	7.30 ± 3.44	7.60 ± 1.52	-0.30 (4.44%)	0.723
Walk six minutes (meters)	289.39 ± 39.34	190.00 ± 41.83	99.39 (34.35%)	0.002*
Stationary gait (repetitions)	18.52 ± 4.04	13.80 ± 3.27	4.72 (25.47%)	0.027*

Legenda: *p<0.05 GCA: Case Group. GCO: Control Group.

On average of the tests performed, the Case Group performed better in the sit and reach test, with an improvement of 10.62% (p=0.034) in relation to the Control Group. Similar results were found in the behind-the-back reach test (improvement of 77.15%, p=0.046), in the six-minute walk (improvement of 34.35%, p=0.002) and in stationary walking (improvement of 25. 47%, p=0.027).

DISCUSSION

The present study sought to verify the influence of physical exercise on aging, and our main results indicate that the Case Group performed better in the sit and reach test, reach behind the back test, six-minute walk and stationary gait, with a significant difference (p<0.05).

Corroborating the findings, the study by Dornelas et al., (2016), which evaluated 27 elderly women, applying the aerobic exercise and muscle stretching protocol, showed the positive effects of physical exercise in improving the quality of life in the Exercise Group (EG). Likewise, the study by Barros et al., (2011), which applied resistance and muscle stretching exercises twice a week for ten months, observed beneficial effects on the quality of life of the elderly.

In our study, it was possible to observe that the sitting and standing, elbow flexion and coming and going tests, despite not showing significant differences, showed differences between the Case and Control Groups for these variables.

This is in agreement with Junior et al., (2016), who for six months performed walking, muscle stretching and dancing exercises three times a week in two groups, proving the influence of the exercises. They achieved improvements not only in physical aspects, but also in self-esteem, security in day-to-day activities and personal motivation.

Furthermore, it is suggested that the best performance of autonomous capabilities occurred due to the classes practiced by Case Group, which had a large volume of classes (average of 60 minutes) and included stretching at the beginning and end of each training session. These characteristics, according to Dantas (2014), are predominant in the training of physical capabilities that prove to be more effective when practiced in groups.

Consistent with these findings, the study by Nunes and Santos (2009) found that elderly people who practiced walking had better resistance and flexibility when compared to elderly people who practiced another modality or who did not exercise.

While Biehl-Printes (2014) found that elderly women included in a physical exercise program showed better functional capacity in all Fullerton Battery tests, results also found in the study by Mazo et al., (2014).

Using 34 women over 50 years old, practicing strength training for a period of six months, Junior et al., (2016) verified an increase in strength and static balance, variables that did not show better levels in the case group of the present study, a fact that may have occurred due to the predominance of exercise practiced.

Additionally, Perales et al., (2014) observed that the practice of moderate or vigorous physical activity in the elderly has a beneficial influence on the quality of life of this population.

In short, the practice of physical exercises of different modalities contributes to promoting satisfactory adaptations in the functional capacity of elderly people, providing an increase in lean mass, flexibility, aerobic capacity and functional independence (Almeida, Araújo, 2003).

However, the present study found a better condition of flexibility and aerobic capacity in elderly women, a fact that may have occurred due to the elderly presenting, mainly, large declines in flexibility and aerobic capacity resulting from aging (Dantas, 2014).

Also, the predominance of training carried out by the Caso Group may have favored better adaptation to the capabilities that suffered the greatest deleterious effects of aging.

It is understood that flexibility is directly linked to quality of life, functional independence, prevention of falls and musculoskeletal injuries, and is of great importance for the elderly (Rebelatto et al., 2006).

Flexibility also promotes aerobic resistance, which favors quality of life and functional capacity, increasing the abilities to perform daily activities (Teixeira, 2015).

Considering aerobic exercises as those that use large muscle groups, being performed uninterruptedly for a period of more than three minutes, predominantly using the oxidative system with energy supply for their practice, such as walking, running, cycling, swimming, among others (Dantas, 2014), this training model, when used in elderly people with moderate to vigorous intensity, promotes satisfactory results, as recommended by American College of Sports Medicine (ACSM, 2010).

A fact that had already been verified for some time, when Fiatarone et al., (1990) demonstrated that high-intensity strength training, carried out three times a week, lasting eight weeks, with elderly people between 86 and 96 years of age, showed proven efficiency.

The results provided a 174% increase in muscle strength, showing that advanced age does not limit the benefits that strength training can promote.

Therefore, aerobic exercises and muscle stretching are easy to apply and monitor for elderly women who present signs of limiting pathologies such as arthritis, osteoarthritis and others, in addition to improving their quality of life. In this sense, we observed that flexibility and aerobic resistance are extremely important for the functional capacity of elderly people, which have been shown to be better in elderly people who practice physical exercise.

The present study has limitations, when using interventions with elderly women, the reduced number and sample loss are inevitable. We therefore suggest, for the purposes of greater evidence and scientific effects, that it be carried out with the largest number of volunteers and over a longer period.

CONCLUSION

In conclusion, the participation of elderly people in continuous physical exercise programs can reverse or delay the loss of daily functions. With this study, we observed that elderly people who practice physical exercise have better functional capacity, in terms of flexibility and aerobic resistance.

When a person is part of a combined physical exercise program, they become active, with high self-esteem and mood, which allows them to enjoy the benefits arising from regular sports practice, contributing to healthy aging.

However, it is recommended that experimental and longitudinal studies, with more variables and training resources, be used to further highlight the benefits of exercise for healthy aging.

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