

PHYSICAL EXERCISE METHODS ON HEALTH INDEXES, FUNCTIONAL AUTONOMY AND QUALITY OF LIFE OF BRAZILIAN ELDERLY PEOPLE: AN INTEGRATIVE REVIEW STUDY

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Abstract: In Brazil, demographic evolution shows that the aging of the population has raised concerns regarding the health and quality of life (QoL) of elderly people. Given this context, this study aimed to verify the effects of different exercise methods on health indicators, functional autonomy and QOL of Brazilian elderly people. The methodology comprised an integrative review of the literature with studies selected from the databases: Portal de Periódicos Capes, Scientific Electronic Library Online (SciELO) and Google Scholar. With the descriptors: Physical health; Elderly, Level of physical activity, Functional autonomy, body mass index and quality of life. 13 scientific articles were selected: experimental (n=8) and cross-sectional (n=5). This time, the literature review on “Effects of Physical Exercises on Health Indices, Functional Autonomy and QoL of Brazilian Elderly People, revealed in conclusion that the health indices, functional autonomy and QoL of active elderly women who practice physical activities, to mention: functional training, water aerobics, multicomponent, multimodal exercises and weight training are better when compared to elderly women who do not practice any type of physical activity.

Keywords: Physical health; Elderly, Level of physical activity, quality of life.

INTRODUCTION

The aging of the world population is a current phenomenon, which is present in all countries, understood as people of advanced age and the elderly, who require greater attention, as society's life expectancy has increased. However, with poor health, compromised cognition, low levels of functional autonomy leading to dependence on day-to-day activities, these problems may be associated with a lack of physical activity (BOUAZIZ et al., 2016; LOPES et al., 2016; WHO, 2015).

In Brazil, life expectancy has also been increasing, thanks to improvements in sanitation, treated water, scientific progress, public health care and medicine, which contributes to this increase. Thus, in 2012, the elderly population in Brazil reached 25.4 million, of which 56% were women. In this sense, the Brazilian population continues to grow older, reaching the mark of 30.2 million elderly people in 2017 (IBGE, 2017; 2018).

The aging process is strongly associated with declines in multiple aspects, including: morphological, physiological, biochemical, psychological and functional, which has a negative effect on the performance of activities of daily living (ADVs), and is also associated with greater risks of falls (LAUDANI et al., 2013; BORBA-PINHEIRO et al., 2017;).

In women, the changes resulting from aging are maximized by the menopause process, defined as the permanent cessation of menstruation resulting from ovarian failure, characterized by the occurrence of twelve consecutive months of amenorrhea (natural menopause). This process is characterized by a hormonal imbalance, which results in physical and psychological changes that lead to problems such as body self-image, with problems in physical health: musculoskeletal, cardiovascular and mental health (BURGER et al., 2007),

In this sense, encouraging the practice of physical activities can be a controlling factor in the degenerations maximized by aging, especially from the age of 30, as with each decade the aging process becomes more accentuated. Furthermore, physical activities can also control cognitive declines in elderly and elderly people (DIAS et al., 2014; RESENDE-NETO et al., 2019; CARDOSO et al., 2021).

Due to the demographic increase of elderly people around the world, governmental and non-governmental public policies must be

encouraged and implemented to avoid greater harm to health, including: physical and emotional harm that affects the functional independence of the elderly (BORBA-PINHEIRO et al., 2017).

Given this problem, the present research can justify its execution, as it can show the scientific community a physical health profile of elderly Brazilian women. Thus, the following research problem arose to investigate: What exercise methods are recommended to improve health indices, functional autonomy and QOL of active Brazilian elderly people?

Thus, the objective of this study was to verify the effects of different exercise methods on health indicators, functional autonomy and QOL of Brazilian elderly people.

METHODOLOGY

This is a study with characteristics of an integrative literature review (SOUZA; SILVA; CARVALHO, 2010), through an approach based on cross-sectional and experimental studies, analyzing descriptive and experimental research with relevant interventions for practice practice. professional in physical education, highlighting the main effects on the topic addressed. Thus, the following methodological steps were carried out: 1) Identification of the theme and guiding question; 2) Search in Literature; 3) Data collection; 4) Critical analysis of selected studies; 5) Discussion of results; 6) Presentation of the systematic review synthesis (GRUPO ANIMA EDUCAÇÃO, 2014).

The present study is based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) guidelines, which uses a specific checklist for conducting bibliographical research (GALVÃO, PANSINI, HARRAD, 2015). Within this context, for the development of the research, the following guiding question was created: “*What exercise methods have a positive impact on indicators*

of health indexes, functional autonomy and quality of life in active Brazilian elderly women?”

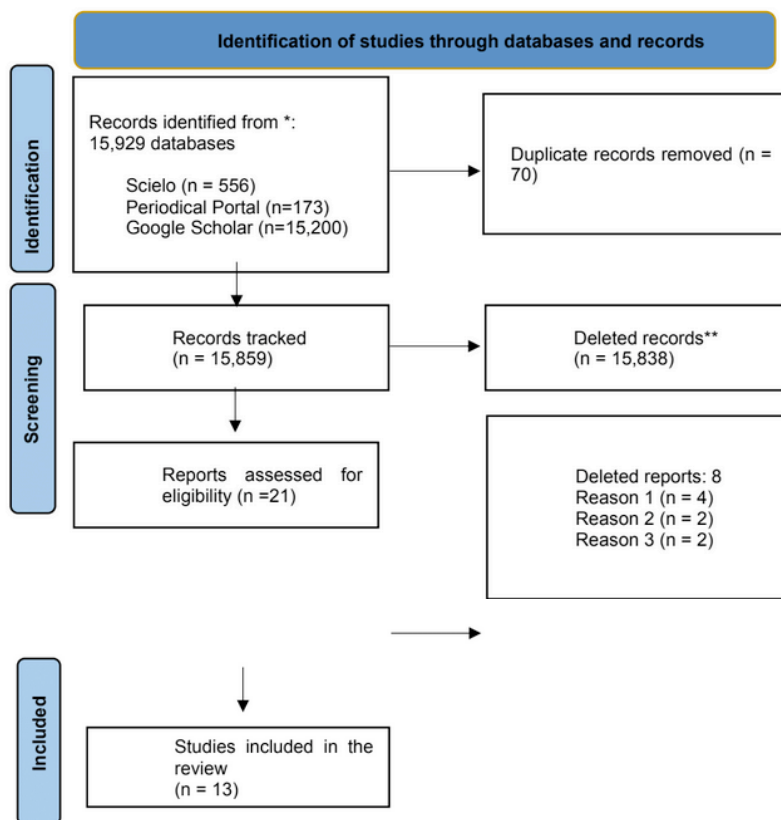
The collection and selection of data/articles were carried out by two independent and experienced researchers, with doubts being resolved by a third evaluator, with a language and time filter from March 20, 2013 to August 20, 2023 on the following database platforms data: Capes periodical portal, *Scientific Eletronic Library Online (SciELO)* and Google Scholar. Then, the descriptors: Physical health; Elderly women, level of physical activity, functional autonomy, body mass index and quality of life were grouped into a single Boolean phrase using AND/ OR.

The inclusion criteria for the selection of articles were: Cross-sectional descriptive quantitative studies and experimental studies, published in full between the years 2013 and 2023, publicly accessible and online, in Portuguese. As exclusion criteria, literature review articles, course completion papers, experience reports, case studies, theses and dissertations, production of only abstracts in the annals of scientific events, duplicate studies and studies that were not related to the theme.

RESULTS

Figure 1 shows the selection process of the articles selected in this research. The process presents a sequence of searches in the chosen databases, inclusion and exclusion actions until the final result for the number of articles (n =13).

Table 1 presents the results for the studies selected following the criteria established in this research. These results show that eight experimental and five descriptive studies were selected. Of the experimental studies, two were on bodybuilding, two on functional training, two on water aerobics, one multicomponent training and one multimodal. In table 1, the following were described: author/year; objective of the study, type of research;



Reason 1 = Inclusion/exclusion criteria (4)

Reason 2 = It does not essentially address the research topic (2)

Reason 3 = It does not meet the research objectives (2)

| Author(s) Year | Objective | Design | Methodology | Results | Conclusion |
|-----------------------|--|--|--|--|---|
| Mynarsk et al. (2014) | To analyze the effects of different physical exercise programs on anthropometric measurements (AM) and functional autonomy (PA) of elderly women at risk of fracture | Controlled clinical experimental study | 40 elderly women underwent 35 sessions (1h, 2 times/week) of strength training (GM, n= 13), or functional gymnastics (GF, n= 12) or aerobic gymnastics (GA, n= 15). AM and PA were evaluated before and after training. | There were no improvements in AM after 35 sessions in the three groups. PA, on the other hand, showed improvements in the tests of getting up from a sitting position, getting up from a prone position and in the general index for GM. In the 10m walking test there was a time x training interaction, demonstrating a greater magnitude of the effect on GM. | Weight training was more efficient in improving PA when compared to functional gymnastics and aerobics in elderly women at risk of fractures. |
| Alberte et al. (2015) | To analyze the factors related to the quality of life of elderly women in the city of Guanambi (BA), in 2016. | Quantitative, cross-sectional and descriptive study. | 550 elderly people evaluated through data collection with a semi-structured situational diagnosis form and the World Health Organization Quality of Life (WHOQOL-Bref) to measure the quality of life of this population segment | The well-being of elderly women was affected by the reduction in financial resources. The elderly women were mostly illiterate, retired, without a spouse, living in multigenerational homes and 68.2% had a positive perception regarding their QoL, even living in adverse situations. | The research highlighted the need to implement actions, aimed at health care, recreation and socialization that enable autonomy and independence, to improve QoL. |

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| Da Rocha et al. (2016) | To evaluate the functional fitness and quality of life of elderly people participating in an Open University of the Elderly | Descriptive, comparative and cross-sectional study | The sample consisted of 189 elderly women and 50 elderly men, divided into three age groups (60 to 64 years old, 65 to 69 years old and 70 years old or more). Functional fitness was assessed by the Senior Fitness Test and QoL by the WHOQOL-OLD | Obesity in elderly men aged + 65 years and overweight and obesity in women aged 60-64 years. Functional fitness: There was no difference between age groups and gender in most tests. Values below average in most functional fitness tests for elderly people at UAMI, but satisfied with their QoL (score of 66.16%) | The functional fitness of the elderly at UAMI is below average, but they are satisfied with their general QoL. |
| Inumaru et al. (2018) | Evaluate the aquatic exercise program on the quality of life and functional capacity of elderly women at UNATI PUC-GO | Experimental with analytical characteristics, longitudinal and quantitative quasi-experimental | 16 elderly women were selected. QOL was assessed using the WHOQOL-Bref questionnaire and for functional capacity (FC) the 6-minute walk test (6MWT) was used. Data collection was carried out over a period of three months | Statistical improvements were found for the Water aerobics group for the 6MWT and for QoL in the psychological, environmental and general domains | The study showed that a water aerobics program was effective in improving the aerobic capacity and QoL of elderly women. |
| Paula et al. (2019) | To evaluate the anthropometric profile, functional autonomy and aerobic capacity of hypertensive elderly people treated by the Program | Experimental study. | Women over the age of 60, with a previous diagnosis of high blood pressure participated in training with a variety of exercises. | After 12 weeks of intervention, a reduction in body mass, body mass index, neck circumference, chest, waist, abdomen, hip MG, %BF, FPG, SBP, in C10 time, LPS, LPDV, LCLC and an increase in MM. | A 12-week physical training program was effective in improving the anthropometric profile, blood pressure, fasting glucose and functional autonomy of hypertensive elderly people. |
| Borba-Pinheiro et al. (2019) | To verify the impact of a training program with functional exercises (FT) on health indices, functional autonomy, balance and body composition variables of elderly women. | Experimental study without control group | 13 volunteers aged 64.7 ± 3.2 years were evaluated during 10 weeks, 3 alternate days/week of RT for health indices: WHR, IAC, waist-to-hip ratio (WHR) and body mass index (BMI); and body composition (three-fold protocol): lean mass, % fat, excess mass and absolute fat; functional autonomy (GDLAM protocol) and static balance using this single leg with eyes open and closed. | For health indices, there was an improvement in the variables: waist-to-height ratio (WHR; $\Delta\% = 3.44$) and central adiposity index (IAC; $\Delta\% = -2.13$). In body composition, there was a statistical improvement for the % of fat ($\Delta\% = -4.13\%$), lean mass ($\Delta\% = 2.75\%$) and excess mass ($\Delta\% = -14.29\%$). In functional autonomy there was an improvement in the GDLAM index (IG; $\Delta\% = -9.22$), which did not occur in the balance tests. | The 10-week functional training program was efficient in improving IAC and WHR health indices, functional autonomy, % fat, lean mass and excess mass, maintaining the WHR, BMI and balance variables. |
| Guimarães et al. (2020) | Analyze the effects of strength training and the perception of the risk of falls in the elderly | Uncontrolled experimental study with control group | 22 elderly women were selected into two groups: CG (n=11) sedentary (63.0 ± 2.4 years) and EG (n=11) physically active elderly (64.8 ± 2.4 years). Functional autonomy, the Senior Fitness Test (SFT), in addition to the falls risk questionnaire were assessed. The EG underwent 8 weeks of functional training, 3 times/week. | The EG had improvements $p < 0.05$, intra-group and in the inter-group comparison for functional autonomy and for the SFT test battery | The regular practice of functional training applied to elderly women can positively promote the physical capabilities associated with functional autonomy, which in turn are decisive in preventing falls in this population. |

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| Vagetti et al. (2020) | Verify the association between functional fitness and quality of life in elderly women participating in a physical activity program | Cross-sectional descriptive study | 1,737 elderly women participating in a physical activity program. Sociodemographic Questionnaire, the (IPAQ), and the Whoqol-Brefe Whoqol-Old QoL questionnaires. The SFT functional aptitude test battery was applied. | Elderly women with adequate functional fitness were more likely to have better QoL and domains in the assessment of the WHOQOL BREF and WHOQOL OLD | Better functional fitness is positively associated with a positive perception of QoL and its specific domains for elderly women. |
| Silva-Rumão et al. (2022) | Evaluate the effects of 18 weeks of a multimodal training program in elderly women with reduced functional autonomy | Uncontrolled experimental | 12 elderly women underwent multimodal training (18 weeks, 3x/week). Functional autonomy was assessed using the GDLAM protocol: walking 10 meters; get up from a sitting position; get up from the prone position; getting up from a chair and moving around the house and was the general index (GI). | There was an improvement in functional autonomy of $23.1 \pm 18.0\%$ from the pre-test in the IG ($41.05 \pm 6.66s$) to the post-intervention IG ($30.81 \pm 4.94s$) ($p < 0.001$). In the individual comparison of tests, improvements were observed in the C10m ($p < 0.001$), LPS ($p = 0.009$) and LCLC ($p = 0.004$) tests. | The proposed training was able to improve the functional autonomy of the elderly people studied. |
| Da Silva et al. (2023) | To evaluate food consumption, nutritional status and physical activity level of elderly women practicing PE | Cross-sectional descriptive study | 45 elderly women who practice physical exercise (PE) with an average age of 67.8 years were analyzed, in addition to food consumption, level of physical activity, nutritional status and body adiposity. | A high percentage (57.8%) was overweight and 87.8% had high adiposity, indicating a risk of diseases associated with obesity, in addition to inadequate consumption of fats, calcium and vitamin B6 | Need for nutritional interventions associated with the practice of physical activity, towards comprehensive health care for better QoL |
| De Souza et al. (2023) | To investigate the level of physical activity and quality of life of elderly people, who suffered falls, living in a small town. | Epidemiological, descriptive study, with a cross-sectional design. | 74 elderly people aged 71.2 years who suffered falls were evaluated for their level of physical activity - <i>International Physical Activity Questionnaire</i> (< 150 min/week of physical activity = insufficiently active). QoL was verified by <i>WHOQOL-BREF</i> in 4 domains. | Prevalence of 49.50% of insufficient physical activity level among elderly people who suffered a fall. Higher scores were observed in the perception of QoL in the psychological (70.40 ± 14.70) and social relationships (69.30 ± 17.00) domains. Insufficiently active elderly people demonstrated lower scores. | High prevalence of insufficient physical activity level and the perception of quality of life was higher for the psychological domains and social relationships among elderly people who suffered falls. |
| Sodre et al. (2023) | Verify the effectiveness of recreational water aerobics at SESC-RJ, Madureira on the functional autonomy of elderly women and experimental water aerobics | Experimental study that met the recommendations of the Consolidated Standards of Reporting Trials (CONSORT). | Women aged between 60 and 94 years old and three groups were formed: (1) recreational water aerobics group from SESC-RJ, Madureira (GHR=24); (2) experimental water aerobics group (GHE=35) and (3) control group (CG=30). | There was a significant difference in the general functional autonomy index (IAFG) post intervention (GHR=43.8 \pm 13.1; GHE=62.3 \pm 18.8; CG=38.6 \pm 11.5). | Water aerobics based on scientific training principles contributed to increasing the functional autonomy of elderly women. |
| Da Silva, De Souza e De Lemos (2023) | Objective: To evaluate and compare the effect of two intervention programs in primary health care on the quality of life and functionality of elderly people. | Experimental study without control group | 17 elderly people (both sexes) were randomly allocated into 2 groups with a weekly frequency of once (G1=9) and twice (G2=8). QOL (SF-12), geriatric depression (GDS-4) and functionality (TUG and 6MWT) were assessed. A RT program was carried out with three sets of 12-15 repetitions of 50 minutes in 12 weeks | The elderly aged 61 to 86 years were 70% women, with low education and 70% reported systemic arterial hypertension. There was an increase in functional mobility in both groups, and an increase in the distance covered in the 6MWT only in G2. There was no difference in the pre- and post-test QoL dimensions. | The G2 showed improvement in both functionality tests. Therefore, intervention twice a week is suggested for care groups to improve functional capacity. |

Table 1. It describes the results for the 13 selected studies.

methodological description, main results and conclusion.

DISCUSSION

The research that aimed to verify the effects of different exercise methods on indicators of health indexes, functional autonomy and QoL of active Brazilian elderly people, presented 13 studies (8 experimental and 5 cross-sectional), showing, among other variables, that: Health indices, functional autonomy and QoL of active elderly people who practice physical activities such as functional training, water aerobics, multicomponent, multimodal exercises and bodybuilding are better when compared to elderly women who do not practice any type of physical activity.

The present study confirms in its results the value of physical activities for functional autonomy, health indices and QoL for the health of elderly people. Both the World Health Organization (WHO, 2010) and the Ministry of Health (BRAZIL, 2017) provide guidelines for the practice of physical activity (PA) in the elderly, aimed at health and healthy aging. The WHO recommends that older people perform at least 150 minutes of moderate aerobic exercise or 75 minutes of vigorous activity/week, combined with strength exercises on two or more non-consecutive days (WHO, 2010). The Brazilian Ministry of Health aligns these recommendations, emphasizing the importance of activities that involve joint movements and muscular resistance, in addition to the need for prior medical evaluation and professional monitoring throughout the physical training process (BRASIL, 2017), which is also in line with the results of this research.

Two studies shown in Table 1 showed positive effects of water aerobics practice by elderly women with statistical improvements in functional autonomy, QoL and health indices.

In this sense, water aerobics has been widely recommended by health professionals, because it has a great motivational factor, which is social interaction due to the fact that it is carried out in a group, contributing to better socialization, and in parallel, important contributions have been observed for the improvement in daily activities (TEIXEIRA et al., 2018). Water aerobics is a rhythmic and aerobic modality that requires the recruitment of large muscle groups, helping to increase general physical fitness, increase muscle mass, bone mineral content (less effective) and reduce total body mass, which also results in gaining strength and flexibility (ELIAS et al., 2012). Buoyancy, pressure and thermal exchange are physical properties of water that benefit those who practice aquatic activities, minimizing the risks of falls, fractures and injuries, making this modality well regarded by the elderly and many health professionals (FREITAS, 2008). Thus, it can be seen that water aerobics has a positive effect on people's lives, which is corroborated by the studies in Table 1.

Another exercise method presented in the results of Table 1 was resistance training (RT), popularly known as bodybuilding, which is considered one of the best exercises for maintaining the physical health of elderly people, with positive effects on the variables evaluated in the objective proposed in present research.

RT has been widely studied regarding its beneficial effects on health variables in the elderly, as indicated by several studies (PETERSON et al., 2010; LATHAM et al., 2003; BORBA-PINHEIRO et al., 2019; GUIMARÃES et al., 2020). This exercise modality has been associated with improvements in muscle mass, muscle strength and bone mineral density, contributing to the prevention of sarcopenia and osteoporosis in the elderly (PETERSON et al., 2010; LATHAM

et al., 2003). Furthermore, RT also proves to be effective for the functional capacity, autonomy and QoL of elderly people, positively influencing the performance of daily activities and functional independence (BORDE et al., 2015). This evidence highlights the value of weight training as an effective strategy to promote health and active aging in the elderly, which can also be confirmed in experimental studies by Borba-Pinheiro et al. (2019) and Guimarães et al. (2020), these researches are presented in Table 1

Functional training (FT) was another exercise method found in this study (Chart 1), showing positive effects on autonomy, BMI and QoL in the elderly.

PT has also emerged as a beneficial physical training approach to improve the health of older adults, offering exercises that aim to improve strength, balance and mobility with a focus on ADLs. Studies such as that by Cadore et al. (2013) and Granacher et al. (2013) showed that PT programs can improve muscle strength, balance and functional capacity in the elderly. Furthermore, PT has also been associated with a reduction in the risk of falls, which is of great value in preventing fractures in this population, as highlighted by Sherrington et al. (2020). These combined benefits contribute to improving the QoL and functional independence of the elderly, also showing the importance of PT as an effective strategy for promoting health at this stage of life, which is reinforced by the studies selected in Table 1.

These results reinforce the importance of RT as an effective strategy to promote health, through personalized RT approaches allowing exercises to be adapted to the needs of daily life. With this, TF becomes another safe and effective strategy to promote active and healthy aging in people.

Multicomponent and multimodal exercise methods were also identified in this study

(Chart 1), showing effects on the ADL of elderly people. The association of multiple exercises in the same training protocol has also promoted positive effects in promoting the health of the elderly, Abreu et al. (2021) recommends incorporating aerobic, resistance, flexibility, motor coordination, as well as balance and agility exercises into a single training program. In line, Rocha et al. (2017) emphasizes that the participation of elderly women in physical exercise programs that seek to promote health, develop physical capabilities: strength and cardiovascular resistance, which can cause specific physiological changes in the body. These authors explain that these physical capabilities can be developed through combined training, that is, combining two or more exercise methods.

Increasingly, acute and chronic effect studies show that the combination of different exercise methods combined in the same program or session can be effective in improving the gait performance of elderly people, among other health-related parameters, such as functional independence (CARDOSO et al., 2021). According to Castro, Lima and Duarte (2016), methods that use multiple exercises can induce improvements in muscle function and structure in different age groups and clinical conditions, especially for the elderly.

The recommendations of the American College of Sports Medicine (ACSM, 2018) for the practice of exercises in the elderly are in line with the results of this study, it is worth highlighting that strength gains and the reestablishment of autonomy begin to appear between 4 and 8 weeks of training, with estimates of strength increase. Furthermore, these recommendations reinforce the need to practice PA at least twice a week and, ideally, five times a week, including aerobic and strength training.

LIMITATIONS

The main limitations of this study were the non-inclusion of international search bases, which although the objective was to search for studies with Brazilians, there are also international studies with the Brazilian population. Furthermore, a specific procedure for analyzing the methodological quality of the studies was not used, due to the diversification of methodological designs that included controlled and uncontrolled experiments with a single group and more than one, and also cross-sectional studies. Although the PRISMA protocol meets general qualitative analysis procedures.

CONCLUSION

This research presented a total of 13 studies, eight of which were experimental and five descriptive. Of the experimental studies, two were on bodybuilding, two on functional training, two on water aerobics, one multicomponent training and one multimodal.

With this, it is concluded that elderly people of both sexes, but especially women who practice some type of regular PA, have better conditions associated with health, autonomy and QOL indices compared to those who do not PA. The study also suggests that at least two weekly sessions of regular PA be carried out for better gains and maintenance of these variables.

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