

## The contribution of physical exercise in the aging process



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### ABSTRACT

This study aimed to analyze, through an integrative review, the benefits arising from regular physical exercise as an important component to alleviate functional changes resulting from aging. The research was carried out between October and November 2023, in the following databases: Medical Literature Search and Analysis Online System (MEDLINE), Latin American and Caribbean Literature in Health Sciences (LILACS) and BDENF (Base of Nursing Data), due to the credibility, variety and ease of finding articles in Portuguese and available in full for online access, using the Health Sciences Descriptors (DeCS): “physical exercise”, “aging” and “health of the elderly”, crossing with the Boolean operator AND. From the results found, it was evident that the practice of physical exercise is a healthy alternative to alleviate functional changes resulting from aging

**Keywords:** Elderly, Quality of life, Physical activity.

## 1 INTRODUCTION

Data from IBGE (2022) show that "Brazil's population is older". In the period between 2012 and 2021, the number of people aged 60 and over increased by 3.4%. This shows that the life expectancy of the Brazilian population is constantly growing.

Quality of life, well-being, and good health conditions are some of the essential factors to increase the life expectancy of a population, which, in the current scenario, tends to a progressive aging process, modifying the configuration of the pyramids, with the growth of their top (Yabuuti et al., 2019). With the demographic change in Brazil, there has been a reduction in mortality rates and an increase in life expectancy, proving the increase in the number of elderly people. Currently, aging is part of the social reality, resulting in statistical changes and new challenges, which have a direct impact on the public health system. This is a universal process, which is evidenced by the psychological, social, and biological changes inherent to the life process, which, depending on



genetic conditions, lifestyle, and even the environment, end up occurring differently among people (Silva et al., 2019).

According to the World Health Organization, quality of life is according to a person's understanding of their health, considering their values and those of the society in which they live, their culture, their goals, expectations, standards and concerns (WHO, 1998).

According to Vecchia et al. (2005), the quality of life of the elderly is related to social activities, self-esteem, well-being, willingness to perform daily tasks, level of economic and emotional well-being, self-care, family support, health status, cultural and moral values and religion.

According to the Ministry of Health, the state of health is currently characterized by an increase in non-communicable diseases due to the greater adoption of unhealthy lifestyles, with emphasis on poor diet and lack of physical exercise, as a result of industrialization and globalization processes.

However, for Arpini and Martini (2021), the physiological, functional, socio-affective, and psychic changes common in aging can be mitigated or delayed with the practice of systematized physical activity, practiced regularly, with professional guidance. In this sense, the authors consider that due to the fact that the population has a longer life expectancy, it is important to determine the mechanisms by which physical exercise can improve the health, functional capacity, quality of life and independence of this population.

According to Coelho et al., (2018), 60 to 180 minutes of daily sports exercise can provide several health benefits, such as disease prevention, weight loss and control, development of motor skills, mental performance, and interpersonal interactions. Therefore, physical activity became important to maintain or improve people's quality of life.

It is worth mentioning that some natural changes that are part of the aging process can be reduced when you have the option to follow an active lifestyle (Silva, 2021). Therefore, active and healthy aging, which aims to promote quality of life in the aging process, can be achieved by practicing physical activity habits. This, performed regularly and systematically, can bring many health benefits in addition to providing greater independence to the elderly as well as autonomy to perform their activities of daily living (Santos, 2014).

In this sense, it is intended to investigate, through an integrative review, the benefits resulting from the regular practice of physical exercise as an important component to mitigate or the functional changes resulting from aging. More specifically, it seeks to understand aging and healthy aging, as well as to relate the practice of physical activity as an alternative for healthy aging.



The academic study may contribute to physical educators and professionals who work in the care of the elderly, make the elderly population aware of the importance of physical exercise, in addition to serving as a database for future research on the subject.

## 2 MATERIAL AND METHODS

The method chosen for the present study was the integrative literature review, Mendes, Silveira and Galvão (2008) following the recommended six-step procedure Whittemore and Knafl (2005): identification of the theme and selection of the hypothesis, establishment of the research strategy, definition and collection of data, analysis of the collected data, interpretation and presentation of the results.

The search was carried out between October and November 2023, in the following databases: Online System for Search and Analysis of Medical Literature (MEDLINE), Latin American and Caribbean Health Sciences Literature (LILACS) and BDENF (Nursing Database), due to the credibility, variety and ease of finding articles in Portuguese and available in full for online access, based on the use of the Health Sciences Descriptors (DeCS): "physical exercise", "aging" and "health of the elderly", crossing with the Boolean operator AND.

Search filters were applied according to the inclusion and exclusion criteria determined. The inclusion criteria adopted were: to be a scientific article, in Portuguese, published in journals, between the years 2020 and 2023, to offer text for reading in full and related to the theme of the study. Duplicate articles, theses, dissertations, editorials, letters, and the like were excluded.

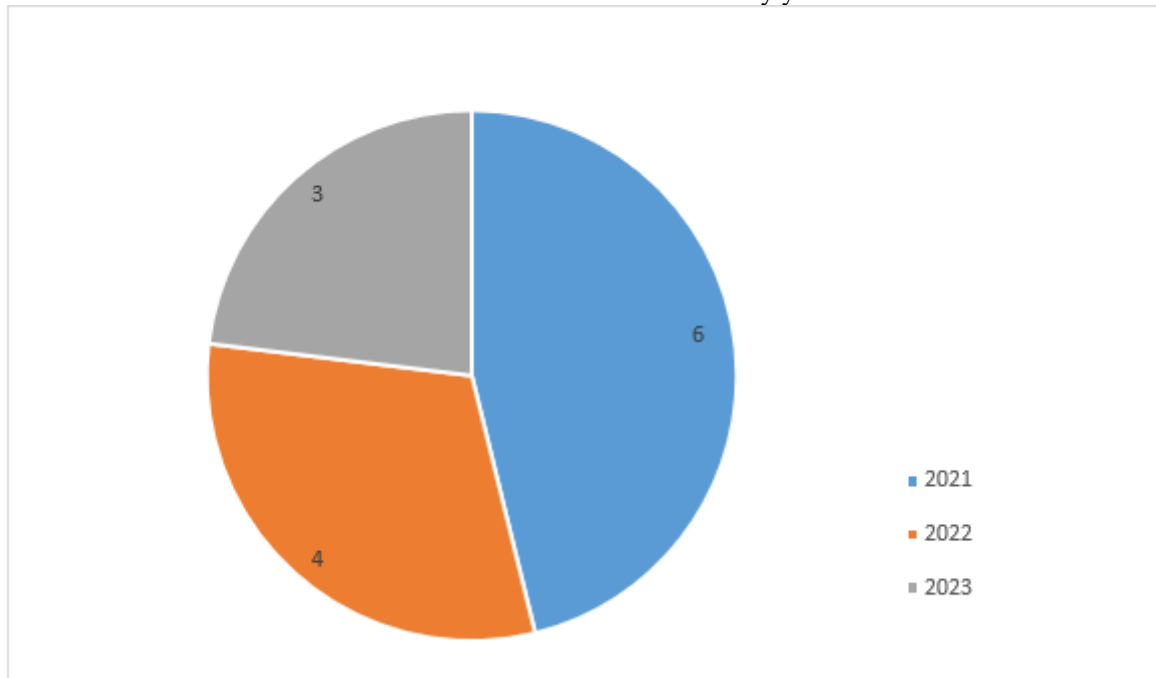
The pre-selection of articles was made by preliminary reading of titles and abstracts. The pre-selected studies were read in full for final selection of articles and analysis. The data of the selected articles were recorded separately, in order of date of publication, in a data collection matrix, with emphasis on typology, objective, methodology, and conclusion (Table 1).

## 3 RESULTS AND DISCUSSION

A total of 15 articles were retrieved. Of these, 2 were excluded due to inability to access. The selected articles were quantified by year and are represented in FIGURE 1.



FIGURE 1 - Distribution of articles by year



Source: author's data

Publications had a higher concentration in 2021, with a significant quantitative decrease from 2022 to 2023.

It is widely described in the literature that physical inactivity is related to the reduction of physiological parameters capable of affecting the health status and maintenance of autonomy of the elderly, and that regular physical activity promotes improvement of functional capacities (NIH Consensus Conference, 1996).

The evolution and concentration of publications on the subject, with articles organized by year, categories, objectives and research results, are represented in Chart 1 and commented on below.

TABLE 1 - Concentration of publications by year, category, objectives and results

YEAR	AUTHORSHIP	TITLE	OBJECTIVE	METHODOLOGY	CONCLUSION	CATEGORY
2021	Ribeiro et al, 2021	Effects of the Pilates method on functional capacity, anthropometric factors, markers Inflammatory disorders and quality of life in sedentary elderly women	OBJECTIVE: To investigate the effects of physical exercises based on the solo Pilates method on functional capacity, anthropometric factors, levels of circulating inflammatory markers and quality of life in sedentary elderly women.	Experimental research	It is concluded that the practice of the solo Pilates method promoted a significant reduction in body composition, serum levels of inflammatory markers, quality of life and maintenance of functional capacity in elderly women Sedentary.	Health status
2021	Hasse et al., 2021	Sedentary behavior, sociodemographic characteristics, health conditions and leisure-time physical activity in the elderly	Associating the prevalence of sedentary behavior with sociodemographic characteristics, health conditions, and activity leisure physics in the elderly.	Experimental research	It was found that there is a greater number of elderly men (88.8%) and women (74.1%) who are physically active in leisure time, but considered sedentary and, in total, a prevalence of approximately 60% of	Health status



					sedentary behavior (CS) among the elderly. Thus, there is a need not only to achieve the recommendations for weekly physical activity, but also to reduce sedentary behavior.	
2021	Santos et al., 2021	Effect of combined training on blood pressure in hypertensive elderly: a systematic review	To analyze the effect of combined training on blood pressure in hypertensive older adults. The Searches were carried out in November 2021 in the databases	Systematic review	The studies showed that after the combined training, there were significant reductions in systolic and diastolic blood pressure values. Although combined training contributed significantly to reducing blood pressure values, the results of this systematic review should be interpreted with caution due to the small number of articles included and their respective methodological limitations.	Exercise and illness
2021	Oliveira et al., 2021	Evaluation of the safety and feasibility of the sit-to-stand protocol Observing Acute Hemodynamic Effects in Hospitalized Older Adults	To evaluate the safety and feasibility of performing the sit-to-stand protocol, observing the acute hemodynamic effects in the elderly Hospitalized.	Experimental research	Sit-to-stand protocol is feasible and safe in hospitalized older adults, as long as it is performed according to eligibility criteria and monitored	Health status
2021	Gomes et al., 2021	Quality of life of the unatian elderly: perception of practitioners and non-practitioners of physical activity	OBJECTIVE: To identify the perceptions of the quality of life (QoL) of elderly practitioners and non-practitioners of physical activities, from the "Open University to the Third Age (UATI)" of the State University of Ponta Grossa, PR	Experimental research	Both activities improve QoL, but with different outcomes for each group.	Health status
2021	Mazo et al., 2021	Handgrip Strength And maximum walking speed according to the level of physical activity and the sex of centenarians	To compare handgrip strength (HGS) and maximum walking speed according to physical activity level (PAL) and gender in centenarian elderly	Experimental research	The study shows that physical activity is closely related to better HGS values, indicating that active centenarian older adults have better overall body strength	Health status
2022	Dinardi et al., 2022	Effect of strength training with different movement speeds on functional capacity and quality of life in the elderly: a systematic review	To conduct a systematic review to verify the impact of ET programs performed with different movement speeds on functional capacity and quality of life in healthy older adults.	Systematic review	It was noticed that most of the studies suggest the performance of AVFT instead of TST in order to improve or maintain functionality and QoL.	Health status
2022	Silva; Menegaldo; Bortoleto, 2022	Gymnastics for all: a look at the development of social relationships in groups of elderly people	to analyze the impact of the practice of Gymnastics for All in groups of elderly people, with regard to the social relationships between the practitioners.	Experimental research	The practice of Gymnastics for All works against what has been highlighted in the literature on old age – a phase of loneliness, exclusion and apathy – and is configured as an environment of intense social coexistence, which promotes quality of life and well-being. In addition, this practice still seems to play	Health status



					an important role in the construction, maintenance and strengthening of social bonds, proving to be an interesting body practice for this age group.	
2022	Rodrigues et al., 2022	Evaluation of the clinical-functional vulnerability of frail elderly after a exercises	To evaluate the effect of exercise in the domains assessed by the Functional Clinical Vulnerability Index (IVCF-20) in frail older adults	Experimental research	Exercise programs can contribute to the improvement of mobility, cognition and functionality of the frail elderly.	Health status
2022	Antunes et al., 2022	Effect of regular physical exercise on serum prostate-specific antigen concentration	OBJECTIVE: To observe the influence of the effect of regular physical exercise in people experiencing the aging process through serum PSA levels, seeking to correlate it with risk factors for benign prostatic hyperplasia.	Experimental research	Regular physical exercise can act in a beneficial way in prostate-related diseases.	Exercise and illness
2023	Braz et al., 2023	Effect of Lian-Gong training on the functional capacity of institutionalized older adults	To identify the effect of Lian-Gong training on the functional capacity of institutionalized older adults and to characterize the profile of the participants	Experimental research	An eight-week training program of Lian-Gong is able to provide increased muscle strength and flexibility in the elderly. It is widely recommended for use in institutionalized older adults, as it contributes to the promotion of musculoskeletal health.	Health status
2023	Cavalcante et al., 2023	Strength training with and without instability does not improve levels Intrinsic Capacity in Older Adults with Cognitive Complaints	To evaluate the impact of strength training on intrinsic ability levels in older adults with cognitive complaints.		Strength training with and without instability devices did not improve levels of IC in elderly patients with cognitive complaints.	Health status
2023	Botton et al., 2023	Physical activities in the prevention and control of cardiovascular diseases in the elderly	To evaluate the relationship between physical activity and prevention or control of cardiovascular diseases in the elderly, seeking a better understanding of the theme addressed in order to improve health care for the elderly.	Integrative Review		Exercise and illness

The study by Ribeiro et al (2021) was an experimental research that aimed to investigate the effects of physical exercises based on the solo Pilates method on functional capacity, anthropometric factors, levels of circulating inflammatory markers, and quality of life in sedentary elderly women. The research showed that the practice of the solo Pilates method promoted a significant reduction in body composition, serum levels of inflammatory markers, quality of life and maintenance of functional capacity in sedentary elderly women, that is, it contributes to the healthy aging process.

Hasse et al (2021) conducted an experimental study to associate the prevalence of sedentary behavior with sociodemographic characteristics, health conditions, and activity. As a



result, a greater number of elderly men (88.8%) and women (74.1%) were found to be physically active in leisure time, despite being sedentary, and, in total, approximately 60% of sedentary behavior prevailed among the elderly. This demonstrates that the need is not only to achieve the recommendations for weekly physical activity, but also to reduce sedentary behavior. This corroborates the idea that regular physical exercise is an important component to mitigate the functional changes resulting from aging.

Santos et al., (2021) conducted a systematic review with the objective of analyzing the effect of combined training on blood pressure in hypertensive older adults. The verified studies pointed out that after performing the combined training, there were significant reductions in systolic and diastolic blood pressure values. However, even with the significant contribution of combined training to reduce blood pressure values, these results should be interpreted with caution due to the small number of articles included and methodological limitations.

The study by Oliveira et al., (2021) was an experimental study that aimed to evaluate the safety and feasibility of performing the sit-stand protocol, observing the acute hemodynamic effects in hospitalized older adults. As a result, they found that, as long as it is performed according to the eligibility criteria and monitored, the sit-stand protocol is feasible and safe in hospitalized older adults. This confirms that it is beneficial to relate the practice of physical activity as an alternative for healthy aging.

In the study by Gomes et al. (2021), which was an experimental research with the objective of identifying the perceptions about the quality of life of elderly practitioners and non-practitioners of physical activities, from the "Open University for the Third Age (UATI)" of the State University of Ponta Grossa, PR, it was possible to verify that both in elderly practitioners and in elderly non-practitioners, physical activities provide an improvement in quality of life, however, with different outcomes for each group. If physical exercise improves quality of life, this research confirms that physical exercise can mitigate functional changes resulting from aging and contribute to healthy aging.

Mazo et al., (2021) also conducted an experimental study aimed at comparing handgrip strength and maximum walking speed according to the level of physical activity and gender in centenarian elderly. It was possible to show that physical activity is closely related to better handgrip strength values, indicating that active centenarian elderly have better overall body strength, that is, there are benefits resulting from the practice of physical activity in the aging process.

The systematic review by Dinardi et al (2022) was conducted to identify the effect of strength training with different movement speeds on functional capacity and quality of life in older adults with a view to verifying the impact of strength training programs performed with



different movement speeds on functional capacity and quality of life in healthy older adults. It was found that a considerable part of the studies suggest performing high-speed strength training to the detriment of traditional training in order to improve or maintain functionality and quality of life in the elderly, which also contributes to healthy aging.

Silva; Menegaldo; Bortoleto (2022) conducted an experimental research on *Gymnastics for All*: a look at the development of social relationships in groups of elderly people with the aim of analyzing the impact of the practice of *Gymnastics for All* in groups of elderly people, focusing on social relationships between people who practiced it. Through the research, they were able to verify that the practice of *Gymnastics for All* acts contrary to what has been emphasized in the literature about old age – loneliness, exclusion and apathy – because an environment of marked social coexistence is recognized, and this provides quality of life and well-being. In addition, this practice plays an important role in building, maintaining and strengthening social bonds, proving to be an important bodily practice for this age.

In the experimental research by Rodrigues et al., (2022) on the assessment of the clinical-functional vulnerability of frail older adults after an exercise program, we sought to evaluate the effect of exercises on the domains assessed by the Functional Clinical Vulnerability Index (IVCF-20) in frail older adults and found that exercise programs can contribute to improving mobility, cognition, and functionality in frail older adults.

Antunes et al., (2022) conducted an experimental study on the effect of regular physical exercise on the serum concentration of prostate-specific antigen to observe the influence of the effect of regular physical exercise in people experiencing the aging process through serum PSA measurement, seeking to correlate it with risk factors for benign prostatic hyperplasia. As a result, they found that regular physical exercise can act in a beneficial way in prostate-related diseases.

The study by Braz et al., (2023) refers to the effect of Lian-Gong training on the functional capacity of institutionalized older adults and aimed to identify the effect of Lian-Gong training on the functional capacity of institutionalized older adults and to characterize the profile of the participants. An eight-week Lian-Gong training program has been found to be able to provide increased muscle strength and flexibility in elderly people, hence highly recommended for institutionalized elderly, as it contributes to the promotion of musculoskeletal health.

Cavalcante et al., (2023) conducted a study to verify whether strength training with and without instability does not improve the general levels of intrinsic ability in older adults with cognitive complaints. The aim of this study was to evaluate the impact of strength training on intrinsic capacity levels in older adults with cognitive complaints. As a result, they confirmed that strength training with and without instability devices did not actually improve intrinsic ability levels in older adults with cognitive complaints.





Botton et al. (2023) conducted an integrative review on physical activities in the prevention and control of cardiovascular diseases in the elderly, with the aim of evaluating the relationship between physical activity and the prevention or control of cardiovascular diseases in the elderly, better understanding the topic, and improving health care for the elderly. They found that the practice of moderate-intensity physical activity is a protective factor against the aging process, in addition to being essential for the control and prevention of cardiovascular diseases.

Chart 1 shows that most studies (70%) addressed the effects of physical exercise as an alternative for quality of life and maintenance of functional capacity in aging. The remaining 30% were developed to verify the effect of regular physical exercise on diseases.

In this study, it was noticed that physical activities improve the quality of life in both practicing and non-practicing elderly, are closely related to better values of manual pressure force, indicating that active centenarian elderly have better overall body strength.

In addition, the practice of Gymnastics for all promotes quality of life, well-being and plays an important role in building, maintaining and strengthening social bonds for the elderly. Performed at moderate intensity, it becomes a protective factor against the aging process, in addition to being essential for the control and prevention of cardiovascular diseases.

In addition, performing strength training at high speed to the detriment of traditional training can improve or maintain functionality and quality of life in the elderly.

The results reaffirm what other authors have said about the benefits of physical activity for healthy aging. For Camboim et al. (2017) and Flores et al. (2018), the habit of performing regular physical activities contributes to promoting a healthy life for the elderly, in addition, it provides freedom to perform daily tasks, and, consequently, enjoy independence. Regular physical exercise reduces the negative consequences of aging, which interact directly with the individual's physiological and psychological processes, in addition to considerably reducing stress risks, combating symptoms of depression and loss of functional capacity, situations that are not uncommon in the experience of old age (Camboim et al., 2017).

The findings are ratified by Batista (2016), who mentions that the practice of physical activity is indicated to overcome depressive symptoms, being considered an ally for the maintenance of the psychic conditions of the elderly, and should be indicated and maintained for as long as possible, respecting the limits of the body.

Despite the lower concentration of studies focused on disease prevention, beneficial effects of physical exercise practices in the elderly have been observed. Solo Pilates has been found to improve body composition, reduce serum levels of inflammatory markers, improve quality of life, and maintain functional capacity in sedentary elderly women. Combined training can reduce blood pressure values. An eight-week Lian-Gong training program has been found to be able to



provide increased muscle strength and flexibility in elderly people, hence widely recommended for institutionalized older adults, as it contributes to the promotion of musculoskeletal health.

In addition, it is possible to promote the safety and feasibility of performing the sit-to-stand protocol, observing the acute hemodynamic effects in hospitalized older adults, as long as it is performed according to the eligibility criteria and monitored. In addition, exercise programs can contribute to the improvement of mobility, cognition and functionality of the frail elderly and, if performed regularly, can act in a beneficial way in prostate-related diseases.

The benefits of regular physical exercise, as can be observed, are well evidenced and described in the literature. However, in the studies surveyed, there was a scarcity of studies related to physical activity and intervention as a beneficial effect on the aging process (Cavalcante et al., 2023; Braz et al., 2023; Rodrigues et al., 2022; Oliveira et al., 2021; Ribeiro et al., 2021).

Thus, this work projects a look at the need and the intention of creating and proposing other studies that use different interventions to measure the beneficial effect – the object of this study – the contribution of physical exercise in the aging process.

Aging is characterized by functional, biochemical and morphological changes, which contribute to the reduction of the functional capacity and quality of life of the elderly. Thus, it is necessary to seek ways to provide opportunities for a less aggressive and healthy aging process (Silva, 2021).

According to Aguiar et al. (2014), a well-planned and periodized exercise program is effective and, consequently, benefits the health of the elderly, making them more independent in their daily activities

In this sense, the physical education professional has the technical skills to prescribe, systematize and guide any training plan, contributing directly to healthy aging, promoting adherence to an active lifestyle (Moreira et al., 2016).

According to Lima et al. (2019), in order to work, guide, prescribe and systematize a training plan, the professional needs to have considerable knowledge about the proposed activity and about the elderly, as well as pay attention to physical limitations or problems, so that biological individuality is respected, they will propose to propose activities performed individually. For Torres et al. (2016), it is evident that professionals who work with the elderly or with the public in this age group should pay attention to the limitations.

#### **4 CONCLUDED**

This study was an integrative review that aimed to verify the benefits of regular physical exercise as an important component to mitigate the functional changes resulting from aging.



From the results found, it can be seen that there are contributions of physical exercise for the elderly, as benefits were identified resulting from the regular practice of physical exercise as an important component to mitigate the functional changes resulting from aging. The practice of physical activity is an alternative for healthy aging.



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