



# IJS

## International Journal of Sciences

Published online 03 20, 2022  
ISSN 2763-5392



# The role of physiotherapy in the prevention of falls and in the improvement of balance in the elderly: a literature review

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### To cite this article:

Ferreira, A.J.S.; Melo, N.F.B.; Silva, J.P.; Albuquerque, F.J.A.; Lima, D.C.P.; Paes, C.L.F.; Melo, M.M.; Melo, K.V.B.; Azevedo, L.M.S.; Oliveira, J.L.S.; Araújo, C.A.S.; Lacerda, S.D.L.; Marques, E.E.; Souza, A.C.A. *The role of physiotherapy in the prevention of falls and in the improvement of balance in the elderly: a literature review*. *International Journal of Sciences*. Vol. 3, No. 2, 2022, pp.69-74. ISSN 2763-5392.

**Received:** 03 02, 2022; **Accepted:** 03 04, 2022; **Published:** 03 20, 2022

**Abstract:** The objective was to identify the performance of physiotherapy and its efficacy in the treatment of prevention against falls in the elderly, providing these people with improvement in quality of life. The collection was of scientific articles taken from electronic bases of scientific publications, and the following were identified: Scientific Electronic Library Online (SciELO), Latin American and Caribbean Literature on Health Sciences (Lilacs), PUBMED and Medline. The search in the databases resulted in the identification of 44 articles, and only 9 publications were selected, in which 35 articles were evaluated

and excluded because they did not have a theme according to the theme. Therefore, it was possible to identify that physiotherapy is an excellent means of treatment for the elderly against the risks of falls, through their physiotherapeutic resources, it was evident the benefits achieved, providing better quality of life, improvement in their physical fitness, besides preventing and treating changes that arise with advancing age.

**Keywords:** Geriatric Physiotherapy. Prevention in falls. Fall in the elderly. Balance.

## 1. Introduction

The limitation to develop such activities can compromise the daily life of people, especially the elderly, with implications for the risk of falls, which can cause irreparable damage to health, generating disabilities and even death. It is agreed that over the years our body undergoes some physiological changes, such as decreased muscle strength and tone, loss of calcium in bones, decreased functional capacity, among others. These are some factors that contribute to making the elderly more vulnerable to falls and osteoarticular problems (GONÇALVES, 2020).

Falls are among the main causes of trauma among the elderly, being considered the sixth cause of death from accidental and non-accidental injuries. In addition to the challenging psychological impact that will be obtained to the elderly, this may cause themselves a possible loss of their autonomy, functional independence, sedentary lifestyle and social isolation. It can bring to the elderly a feeling of inability to perform their activities for their daily life (DELAGE, 2018).

The fall event is the result of a complex relationship between physiological, social, behavioral and environmental factors. Therefore, we know that the aging process is inevitable in people's lives, and with this process changes arise and these changes cause the elderly to become more likely to fall. Given their loss of balance, it is worth mentioning the aspects that can influence the propensity of accidents in the elderly, one of these aspects are the intrinsic factors (Physiological changes) and the extrinsic factors (Objects thrown through the middle of the house, social circumstances, etc.) (FONSECA, 2020).

Old age, or the third age is a phase of life where the person has alterations that lead to decreased strength and degeneration of the organism, which causes several accidents, among them, the most common, the fall. Impairments arise with advancing age, and this increases concerns about this age group, since the elderly are a group more likely to develop chronic diseases in addition to having a high risk of falls due to their age commitment (GOMES; VIEIRA, 2021).

Physical exercise can be used to improve balance to prevent falls. Training with proprioceptive or sensorimotor exercises expands motor control skills, restoring the dynamic stability of the individual. Physiotherapy will act globally with extreme importance aimed at the elderly to reestablish their standards of functionality, through a set of exercises aimed at promoting postural reeducation, improving balance, gaining muscle strength, motor coordination, besides promoting a preventive way for the elderly to re-possess their autonomy, functional independence, restoring their self-confidence in

performing their daily activities more safely (CAMPOS, 2016).

The research aims to highlight the performance of physiotherapy preventing the elderly, against falls, and provide these people with a quality of life, more active and safer for their daily lives. In view of the work's need to demonstrate how physiotherapy, through its treatment resources, helps in a beneficial way in the lives of the elderly, providing them with a safer way of living, possessing more autonomy and self-confidence about themselves reducing the risk of accidents.

There are many published articles that show how physiotherapy is active and its contributions to the prevention of falls in the elderly and its benefits obtained. The objective of doing work is to identify the performance of physiotherapy and its efficacy in the treatment of prevention against falls in the elderly, providing quality of life.

## 2. Methodology

This is a descriptive literature review study, as a study that it constitutes a broader review methodology, which allows the inclusion of theoretical literature, as well as studies with different quantitative and qualitative methodological approaches. The study was carried out through a process of systematic analysis and synthesis (CROSSETTI, 2012).

The studies involved in the review are systematically analyzed in relation to their objectives, methods and materials, enabling the reader to analyze the previous knowledge on the probed theme (POMPEO; ROSSI; GALVÃO, 2010).

The collection was composed of scientific articles taken from electronic databases of scientific publications, being identified the following: Scientific Electronic Library Online (SciELO), Latin American and Caribbean Literature in Health Sciences (Lilacs), US National Library of Medicine (PUBMED) and Medline (Medical Literature Analysis and Retrieval System Online).

The search in the database was performed using the following key words: geriatric physiotherapy, fall prevention, falls in the elderly, balance, after which a search was performed through Boolean connectors: Geriatric physiotherapy AND, fall prevention AND, fall in elderly AND, balance. Data analysis was performed in July 2021. Where it will be organized into tables, through Word, for descriptive analysis.

## 3. Results and Discussion

Added to the term's geriatric physiotherapy AND fall

prevention AND falls in elderly ("Fisioterapia Geriátrica "" Prevenção em Quedas" " Queda em Idosos"), With the operator Boolean AND. Four databases were used, SCIELO, LILACS, PUBMED and MEDLINE, in all, 19 published were obtained, among these, 10 studies were in English, 9 in Portuguese among esses, 3 were selected to make up the analysis and the proposed distribution para this work. Thus, 16 were evaluated and excluded because they did not present a theme addressed according to the proposed study.

**Table 1.** Theme of the studies "Geriatric Physiotherapy"," Prevention in Falls ", "Falls in the Elderly".

Themes	No.
Geriatric Physiotherapy	1
Prevention in Falls	1
Falls in The Elderly	1
Total	3

**Source:** Prepared by the researcher based on the studies found in the studies

Added to the terms fall prevention AND falls in elderly AND geriatric physiotherapy ("Fall prevention" "Falls in The Elderly" "Geriatric Physiotherapy"), with the boolean operator AND. Four databases were used, SCIELO, LILACS, PUBMED and MEDLINE, in all, 14 published were obtained, among these, 5 studies were in English, 9 in Portuguese among esses, 3 were selected to make up the analysis and the distribution proposed for this work. Thus, 11 were evaluated and excluded because they did not present a theme addressed according to the proposed study.

**Table 2.** Themes of studies "Prevention in Falls", "Falls in the Elderly", "Geriatric Physiotherapy"

Themes	No.
Prevention in Falls	1
Falls in The Elderly	1
Geriatric Physiotherapy	1
Total	3

**Source:** Prepared by the researcher based on the studies found

Added the terms falls in elderly AND fall prevention AND geriatric physiotherapy ("Falls in The Elderly" "Prevention in Falls" "Geriatric Physiotherapy"), with the Boolean operator AND. Four databases were used, SCIELO, LILACS, PUBMED and MEDLINE, in total, 11 published were obtained, among these, 3 studies were in English, 8 in Portuguese among esses, 3 were selected to make up the analysis and the distribution proposed for this work. Thus, 8 were evaluated and excluded because they did not present a theme addressed according to the proposed study.

**Table 3.** Thematic studies "Falls in the Elderly", "Prevention in Falls", "Geriatric Physiotherapy"

Themes	No.
Falls in The Elderly	1
Prevention in Falls	1
Geriatric Physiotherapy	1

Total	3
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**Source:** Prepared by the researcher based on the studies found

**Table 4.** Selected Articles.

	Origin	Article Title	Authors	Year	Considerations/Thematic
01	Interdisciplinary Journal Medical Sciences	Effects of virtual reality on the balance of healthy elderly	PANASSOL, P.P.; OLTRAMARI, G.; SCHUSTER, R.C.	2017	The findings of this article demonstrate that exercises used in virtual reality is a form of stimulation that helps improve body perception, postural control and favors for a good balance.
02	Interdisciplinary Journal Medical Sciences	Proprioceptive Reeducation In The Balance of the Elderly	SILVA, A.F.F.; SCALLOP, M.M. L.; SAMPAYO, T.C. F.V.S.	2018	The present study proved that the training of proprioceptive reeducation obtained beneficial results for the elderly, obtaining positive results in improving dynamic and static balance, besides improving the quality of performance of daily physical activities.
03	Study. interdisciplinary	Effect of Kinesiotherapy on balance and quality of life in a senior group	PRADO, L.; GRAEFLING, B.C. F.	2019	This study proved through the Berg Balance Scale a positive increase in the post-intervention phase compared to the pre-intervention phase, through a conduct of therapeutic kinesia exercises.

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04	Rev. Soc. Cardiol. State of Sao Paulo	Resistance Exercises for the Elderly Systematized Literature Review	CARMO, E. S.; XAVIER, V.B.; ALVES, V.L.S.	2019	The results of the study showed that resistance exercise demonstrates evidence for increased muscle strength and physical abilities in the elderly.
05	Physiotherapy Brazil	Effects of aquatic physiotherapy versus conventional physiotherapy on the risk of fall in the elderly	SILVA, C. R.; MAGALHÃES, L. F. R.; KEYS, F.M. G.; VIEIRA, E.C. N.; ADAMES, A.P. R.; Brauns, I.S.D.	2020	In the present article it was possible to identify that hydrotherapy and conventional physiotherapy are very effective in the treatment of the elderly, restoring an improvement in balance, gait, motor skills and reducing the risk of falls.
06	CPAQV Journal-Center for Advanced Research in Quality of Life-CPAQV Journal	Comparative Analysis of the Effects of Aquatic Physiotherapy and Therapeutic Bodybuilding on Quality of Life and Balance of the Elderly	ALVES, J.P.S.; BIRTH, P. A. S; BRITO, A.L.; TEIXEIRA, T. A.; SANTOS, M.C. S.S.; SOBRAL, L.L	2020	The findings of this article showed positive results in both treatments, presenting beneficial effects on the quality of life and functionality of the elderly.
07	CPAQV Journal-Center for Advanced Research in Quality of Life-CPAQV Journal	Proprioceptive Method As Preventive Measure of Falls in the Elderly	BERNE, R.C.; BARBOSA, P. H.; MARTELLI, A.	2020	The findings of this article showed that the use of proprioceptive exercises on different surfaces, both in the soil and implements to exercise, provided benefits in balance, motor

					coordination and consequently reducing the risk of falls among the old people.
08	Brazilian Military Magazine De Ciências	The importance of physiotherapy in the functional capacity of elderly people at risk of falls	SOFIATI, S.C. L.; OLIVEIRA, M.M.; GOMES, L.M., VIEIRA, K. V. S.	2021	The present article demonstrated that the practice of physical exercises, balance and proprioception training, kinesiotherapy, grafting in the water were effective in treating the elderly against falls.
09	Health in Focus	The Pilates Method and Aerobic Exercise in the Quality of Life of Sedentary Elderly: Systematic Review	Filho, J.B. R.M.; SILVA, L. L.; AQUINO, S.S.	2021	This study obtained satisfactory results of the pilates intervention method and aerobic exercises, providing an improvement in quality of life, prevention of worsening of chronic diseases and alterations of aging.

According to (PANASSOL, *et al.* 2017), in their present study 16 elderly participated in the sample, 8 (50%) participants in the kinesiotherapy group and 8 (50%) participants in the virtual reality group. The mean age between them was between 69 and 63 years composed of 15 females (93.2) and 1 male (6.8). Comparing the moment of pre-intervention with the post-intervention using the MIF tests: Functional Independence Measure; POMA: Evaluation of Gait and Performance-Oriented Balance; TUG: Timed Up and Go; 6MWT: 6-minute walk test, it was observed that both kinesiotherapy groups and the postural reality group showed improvement in the post-intervention phase in all tests such as mobility, balance, postural control, aerobic capacity and gait.

(SILVA, *et al.*2018), considered that proprioceptive re-education exercises provided the elderly with an improvement in dynamic and static balance, in addition to

their contribution to postural control. In the sample, 11 women with a mean age of 74 years were performed in which the following tests were performed: Sitting for standing (3.16>3.83), Standing without support (4.0=4.0), Sitting without support (4.0=4.0), Standing for sitting (3.5>3.91), Transfer (3.41>3.91) Standing without support with closed eyes (3.66>3.83), Standing with your feet together (3.90>3.91) Reach with outstretched arms (3.50>3.91), Pick up object on the ground (3.66>3.91), Look back over your shoulders (3.80>3.91), Rotate 360° (3.0>3.83), Touching your foot on the stool (3.08>3.58), Standing without support with a foot ahead (2.83>3.25), Standing on a single leg (2.0>3.25). Through the Berg balance scale, it was observed that the post-intervention phase obtained better results compared to the pre-intervention phase where the mean was (47.5) and became 53.02 in the post-intervention phase.

(PRADO, 2019), highlights that kinesiotherapy proved to be an excellent treatment resource for the elderly, helping to reduce the risks of falls, improve balance and functional capacity through a conduct of *kinesiotherapeutic* exercises.

According to (CARMO, *et al.*2019), among the 20 studies that were evaluated, 11 concluded that resistance training improved functional mobility, muscle strength and muscle power. The study provided evidence that resistance exercise promotes improvements in physical abilities in the elderly. However, this study still needs more research related to the subject.

Second (SILVA, *et al.* 2020), the aquatic physiotherapy method obtained better when compared to conventional physiotherapy. 35 people participated in the initial sample. The average age was 65 years. In the TRF, the time showed effect for the Aquatic Physiotherapy (EG) group, with an increase between the first and the second evaluation [DF = 5.053; p = 0.0001], between the first and third evaluations [DF = 11.941; p = 0.000000004] and between the second and the third evaluation [DF = 6.888; p = 0.00002]; for the Conventional Physiotherapy (CG) group, an increase occurred between the first and second evaluations [DF = 4.278; p = 0.001] and between the first and third evaluation [DF = 6.833; p = 0.00001], while no significant difference was found between the second and third evaluation [DF = 2.556; p = 0.146]. Therefore, when comparing the two groups, it is possible to observe higher means and difference for the aquatic physiotherapy group. Mean and comparison of functional range test evaluations between aquatic physiotherapy (EG) and conventional physiotherapy (CG) groups. For the S30, the time showed effect for the EG with an increase between the first and second evaluation [DF = 1.647; p = 0.001], between the first and third evaluation [DF = 3.882; p = 0.00008] and between the second and third evaluation [DF = 2.235; p = 0.008] and for the CG, there was an increase between the first and second evaluation [DF = 1.111; p = 0.025], between the first and third evaluation [DF = 3.556; p = 0.0001] and between the second and third evaluation [DF = 2.444; p = 0.003]. Thus, when comparing the two groups, it is possible to observe higher means and

difference for the aquatic physiotherapy group.

Comparing both treatment methods, the results of aquatic physiotherapy were better than that of conventional physiotherapy, and both interventions contributed to the elderly who were evaluated to obtain positive results in balance, increased gait speed and decreased risk of falls.

(ALVES, *et al.* 2020) compared the effects of aquatic physiotherapy with therapeutic bodybuilding, in which it observed that aquatic physiotherapy obtained better gait results and emotional aspects. Although treatments on different surface both proved effective to develop a better quality of life for the elderly.

(BERNE, *et al.* 2020) It showed that the method of physical therapy intervention through proprioceptive exercises on different surfaces helped to reduce the risks of falls, besides providing the elderly with an improvement in static and dynamic balance. Through a proper gait training that included acceleration and deceleration effects, in which circuits were proposed that aimed to act in gait, strength, balance and proprioception, a functional improvement was observed in reducing the risks of falls. Exercises on unstable surfaces were introduced in the study and a good balance ratio could be observed, obtaining a good motor response.

(SOFIATTI, *et al.*2021) It reports that hydrotherapy helps to improve the functionality of the elderly thanks to the physical properties of water that will help the elderly in reducing joint tension, improving flexibility, improving strength and endurance. Kinesiotherapy proved effective in improving balance and agility, softening the decline in functional capacity. The practice of physical exercises contributes positively against sedentary lifestyle, besides promoting a better physical fitness for the elderly.

(FILHO, *et al.*2021) It highlights Pilates as an excellent intervention method for maintaining quality of life in the field of geriatric physiotherapy. It was proposed to an intervention group with 12 sedentary old women, each session had a time of 30 minutes. They were divided into 3 phases: phase 1: physical fitness lasting 8 weeks, phase 2: increased intensity and endurance of exercises, finally phase 3: maintenance of resistances. This method contributed to an 89% increase in the intervention group with good quality of life. Making Pilates an excellent therapeutic resource for the elderly population. Aerobic exercises there was a significant improvement in physical limitation, physical functioning and cardiorespiratory fitness and increased lean muscle mass after aerobic training that included walking, swimming, running, cycling or some gymnastics exercise, maintaining this training four times a week, lasting 50 minutes, for 6 months. Both treatments were effective, providing an improvement in quality of life for the elderly.

## 4. Conclusion

The study verified and demonstrated how physiotherapy provided excellent results and benefits through its physiotherapeutic resources for the elderly population in the prevention against falls and greater balance

gain. It was possible to identify that physiotherapy has an extensive area of resources that can be used for the well-being of the human being, both kinesiotherapy, and hydrotherapy, Pilate's method, resistance exercises, proprioception, among others obtained their role of contributing to a better quality of life of the elderly, providing improvements in motor skills, a stronger and more balanced body, increased muscle strength and a better quality of life. Therefore, we agree that physiotherapy is an excellent method of treatment to prevent and treat changes that arise with advancing age.

## 5. Acknowledgments

I first thank God for having given me the strength to go ahead and go in search of my goals overcoming all the difficulties and obstacles faced. I thank my family for all the support i have provided throughout my life and to everyone who has contributed to the accomplishment of this work, thank you very much.

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