

## Physiotherapeutic Interventions in Fall Prevention in Parkinson's Disease: An Integrative Review

Intervenções Fisioterapêuticas na Prevenção de Quedas na Doença de Parkinson: Revisão Integrativa

Intervenciones Fisioterapêuticas en la Prevención de Caídas en la Enfermedad de Parkinson: Revisión Integrativa

### RESUMO

**Objetivo:** Analisar evidências científicas sobre a eficácia de intervenções fisioterapêuticas na prevenção de quedas em pessoas com Doença de Parkinson. **Método:** Revisão integrativa da literatura realizada nas bases SciELO, LILACS e Biblioteca Virtual em Saúde, no período de 2010 a 2024. Foram incluídos ensaios clínicos randomizados e estudos controlados que investigaram intervenções fisioterapêuticas voltadas ao equilíbrio, à marcha, à mobilidade e ao risco de quedas. **Resultados:** Onze estudos compuseram a amostra final. As intervenções analisadas demonstraram melhora significativa do equilíbrio, da marcha e da funcionalidade, além de redução do risco de quedas. Programas multimodais e personalizados apresentaram melhores desfechos clínicos. **Conclusão:** As evidências indicam que a fisioterapia estruturada é eficaz na prevenção de quedas, embora persistam limitações metodológicas relacionadas à heterogeneidade dos protocolos e ao tamanho amostral.

**DESCRIPTORIOS:** Doença de Parkinson; Fisioterapia; Prevenção de Quedas; Equilíbrio Postural; Marcha.

### ABSTRACT

**Objective:** To analyze scientific evidence on the effectiveness of physiotherapeutic interventions in fall prevention among people with Parkinson's disease. **Method:** An integrative literature review was conducted using the SciELO, LILACS, and Virtual Health Library databases, covering publications from 2010 to 2024. Randomized clinical trials and controlled studies addressing physiotherapeutic interventions focused on balance, gait, mobility, and fall risk were included. **Results:** Eleven studies were included in the final sample. The interventions demonstrated significant improvements in balance, gait, and functional performance, as well as a reduction in fall risk. Multimodal and personalized programs showed superior clinical outcomes. **Conclusion:** The evidence suggests that structured physiotherapy is effective in fall prevention; however, methodological limitations related to protocol heterogeneity and sample size remain.

**DESCRIPTORS:** Parkinson Disease; Physical Therapy Modalities; Fall Prevention; Postural Balance; Gait.

### RESUMEN

**Objetivo:** Analizar la evidencia científica sobre la eficacia de las intervenciones fisioterapêuticas en la prevención de caídas en personas con enfermedad de Parkinson. **Método:** Se realizó una revisión integrativa de la literatura en las bases de datos SciELO, LILACS y Biblioteca Virtual en Salud, considerando estudios publicados entre 2010 y 2024. Se incluyeron ensayos clínicos aleatorizados y estudios controlados que abordaron intervenciones fisioterapêuticas relacionadas con el equilibrio, la marcha, la movilidad y el riesgo de caídas. **Resultados:** Once estudios conformaron la muestra final. Las intervenciones demostraron mejoras significativas en el equilibrio, la marcha y la funcionalidad, además de reducción del riesgo de caídas. Los programas multimodales y personalizados presentaron mejores resultados clínicos. **Conclusión:** La fisioterapia estructurada es eficaz en la prevención de caídas; no obstante, persisten limitaciones metodológicas asociadas a la heterogeneidad de los protocolos y al tamaño de las muestras.

**DESCRIPTORIOS:** Enfermedad de Parkinson; Fisioterapia; Prevención de Caídas; Equilíbrio Postural; Marcha.

RECEIVED: 02/06/2026 APPROVED: 03/10/2026

**How to cite this article:** Golz MC, Morato WC, Oliveira F, Costa KAR, Fonseca PHN, Costa EE, Santos RC, Faria DA, Tavares PA. Physiotherapeutic Interventions in Fall Prevention in Parkinson's Disease: An Integrative Review. *Saúde Coletiva* (Brazilian Edition) [Internet]. 2026 [cited year month day];17(106):19560-19575. Available from: DOI: 10.36489/saudecoletiva.2026v17i106p19560-19575

- ID Mylene Cristina Golz**  
Bachelor of Physical Therapy, UNA  
ORCID: <https://orcid.org/0009-0004-9561-9881>
- ID Walquiria Calixto Morato**  
Bachelor of Physical Therapy, UNA  
ORCID: <https://orcid.org/0009-0002-7716-8242>
- ID Flávia de Oliveira**  
PhD in Nursing (UFMG); Federal University of São João del-Rei (UFSJ)  
ORCID: <https://orcid.org/0000-0002-9044-6588>
- ID Kelly Aline Rodrigues Costa**  
Master of Health Sciences (UFSJ), UNA College Divinópolis Campus  
ORCID: <https://orcid.org/0000-0003-4289-1780>
- ID Paulo Henrique Nogueira da Fonseca**  
Master of Health Sciences (UFSJ), Federal University of São João del-Rei (UFSJ)  
ORCID: <https://orcid.org/0000-0002-2704-8923>

- ID Elbert Eddy Costa**  
Master of Health Sciences (UFSJ), Federal University of São João del-Rei (UFSJ)  
ORCID: <https://orcid.org/0009-0001-1305-5671>
- ID Regina Consolação dos Santos**  
Ph.D. in Psychology (UFJF); State University of Minas Gerais (UEMG)  
ORCID: <https://orcid.org/0000-0002-7393-3210>
- ID Daniela Aparecida de Faria**  
Ph.D. in Health Sciences (UFSJ); State University of Minas Gerais (UEMG)  
ORCID: <https://orcid.org/0000-0001-8938-9371>
- ID Patrícia Aparecida Tavares**  
Ph.D. in Health Sciences (UFSJ), State University of Minas Gerais (UEMG)  
ORCID: <https://orcid.org/0000-0002-3626-5217>

## INTRODUCTION

Parkinson's disease is a progressive neurodegenerative disorder highly prevalent in elderly populations, characterized by motor changes such as bradykinesia, rigidity, resting tremor, and postural instability, which compromise functional autonomy and significantly increase the risk of falls<sup>(1)</sup>. These events constitute one of the main clinical complications of the disease and are associated with injuries, prolonged hospitalizations, loss of independence, and a decline in quality of life<sup>(2)</sup>.

The increased risk of falls in people with Parkinson's disease is directly related to gait abnormalities, reduced ability to make appropriate postural adjustments, and impaired static and dynamic balance<sup>(3)</sup>. Such changes negatively impact functionality and safety during activities of daily living, especially in older adults.

The therapeutic approach to Parkinson's disease is multidimensional and involves both pharmacological and non-pharmacological interven-

tions, with a particular emphasis on physical therapy, which focuses on functional rehabilitation, improving gait, and controlling postural control, reducing the risk of falls, and improving quality of life<sup>(1)</sup>. Recent evidence indicates that structured physical therapy programs, including balance exercises, muscle strengthening, dual-task training, motor-cognitive practices, and strategies such as rhythmic auditory stimulation, promote positive outcomes in functionality and fall prevention<sup>(4)</sup>.

Despite advances in research, there is significant heterogeneity in intervention protocols, as well as in the frequency, intensity, and duration of physical therapy programs, along with variability in the instruments used to assess fall risk. This methodological diversity limits comparability between studies and hinders the development of clinical guidelines based on robust evidence, creating a significant gap in scientific knowledge.

Given this context, a critical synthesis of the available evidence on effective physical therapy interventions

for fall prevention in people with Parkinson's disease is necessary to inform clinical practice and the planning of rehabilitation strategies targeting older populations.

Thus, the objective of this study was to review the scientific evidence on effective physical therapy interventions for fall prevention and the improvement of mobility, balance, and functionality in people with Parkinson's disease, from 2010 to 2024.

## METHOD

This study is an integrative literature review, conducted in accordance with the method proposed by Whittemore and Knafl<sup>(5)</sup>, which allows for the inclusion and critical synthesis of evidence from different methodological designs, enabling a broader understanding of complex phenomena in the health field, such as physical therapy interventions for fall prevention in people with Parkinson's disease. This method comprises five interrelated stages: problem identification, systematic literature search, assessment of the

# Integrative Review

Golz MC, Morato WC, Oliveira F, Costa KAR, Fonseca PHN, Costa EE, Santos RC, Faria DA, Tavares PA  
Physiotherapeutic Interventions in Fall Prevention in Parkinson's Disease: An Integrative Review

methodological quality of the studies, data analysis and synthesis, and presentation of results.

Although this is not a systematic review in the strict sense, the process of searching for, selecting, and evaluating the eligibility of studies was conducted in a transparent and systematic manner, guided by the recommendations of *the Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA), which were used as an organizational tool, and a description of the selection process, as recommended for integrative reviews with greater methodological rigor<sup>(6,8)</sup>. Additionally, the classification of the review type and the degree of systematization adopted were based on the guidelines proposed by Grant and Booth, who recognize the integrative review as a valid method when combined with structured search and analysis strategies<sup>(9)</sup>.

The research question guiding this review was: *“Which physical therapy interventions demonstrate the greatest efficacy in preventing falls and improving mobility, balance, and functionality in people with Parkinson’s disease?”*

## Search strategy and information sources

The literature search was conducted in the *Scientific Electronic Library Online*, Latin American and Caribbean Health Sciences Literature, and Virtual Health Library databases, selected for their relevance and scope in the fields of health, rehabilitation, and physical therapy. The data collection period covered publications from 2010 to 2024, with the aim of incorporating contemporary evidence, considering the consolidation of clinical instruments, therapeutic protocols, and the incorporation of technologies applied to rehabilitation.

Studies published in Portuguese, English, and Spanish were included in order to broaden the coverage of evidence in both national and inter-

national contexts. The search strategy was structured into thematic blocks, combining controlled descriptors from *the Medical Subject Headings* and *Descritores em Ciências da Saúde* vocabularies, as well as free-text terms, using the Boolean operators *AND* and *OR*, as described below: Block 1 (condition): *“Parkinson Disease” OR “Doença de Parkinson”*; Block 2 (intervention): *“Physical Therapy Modalities” OR “Physiotherapy” OR “Fisioterapia” OR “Rehabilitation”*; Block 3 (outcome): *“Falls” OR “Fall Prevention” OR “Quedas” OR “Equilíbrio” OR “Marcha”*; Block 4 (study type): *“Randomized Controlled Trial” OR “Controlled Clinical Trial” OR “Ensaio Clínico Randomizado”*.

Filters were applied for studies involving adults, humans, and the previously defined languages.

## Eligibility and selection criteria for studies

Randomized clinical trials and controlled studies investigating physical therapy interventions targeting balance, gait, functional mobility, or fall prevention in individuals with a clinical diagnosis of Parkinson’s disease were considered eligible. Literature reviews, case reports and case series, observational studies without intervention, mixed-methods studies without specific analysis for the condition under study, as well as publications outside the established time frame and languages.

Study selection occurred in three sequential stages: (1) removal of duplicates; (2) screening of titles and abstracts; and (3) reading of the full text to confirm eligibility criteria. The entire process was conducted by two independent reviewers, with disagreements resolved by consensus. The study selection flowchart was presented in a diagram, adapted to PRISMA recommendations, exclusively for the purpose of methodological transparency in the search and selection pro-

cess.

## Assessment of methodological quality

The methodological rigor of the included studies was assessed using tools appropriate for clinical trial designs, considering criteria such as randomization method, allocation concealment, blinding, data completeness, and clarity in the description of interventions and outcomes. The purpose of this step was to reduce the risk of bias and strengthen the reliability of the synthesis of findings, in line with the recommendations of *the Revised Standards for Quality Improvement Reporting Excellence* (SQUIRE 2.0)<sup>(7)</sup>.

## Data extraction and synthesis

Data extraction was performed using a standardized form, including the following information: authorship and year of publication, country of origin, study design, sample characteristics, disease stage, description of physical therapy interventions, frequency and duration of programs, comparison groups, outcomes assessed, instruments used, main results, and limitations reported by the authors.

Given the heterogeneity of intervention protocols, therapeutic doses, and assessment tools, we opted for an integrative narrative review, grouping studies based on the similarity of interventions (challenging balance training, rhythmic auditory stimulation, virtual reality, clinical Pilates, motor-cognitive training, mental practice, and telerehabilitation) and the outcomes analyzed. Whenever possible, the direction and magnitude of the observed effects were highlighted.

## Ethical considerations

As this is an integrative literature review based exclusively on secondary data from previously published studies, there was no direct involvement

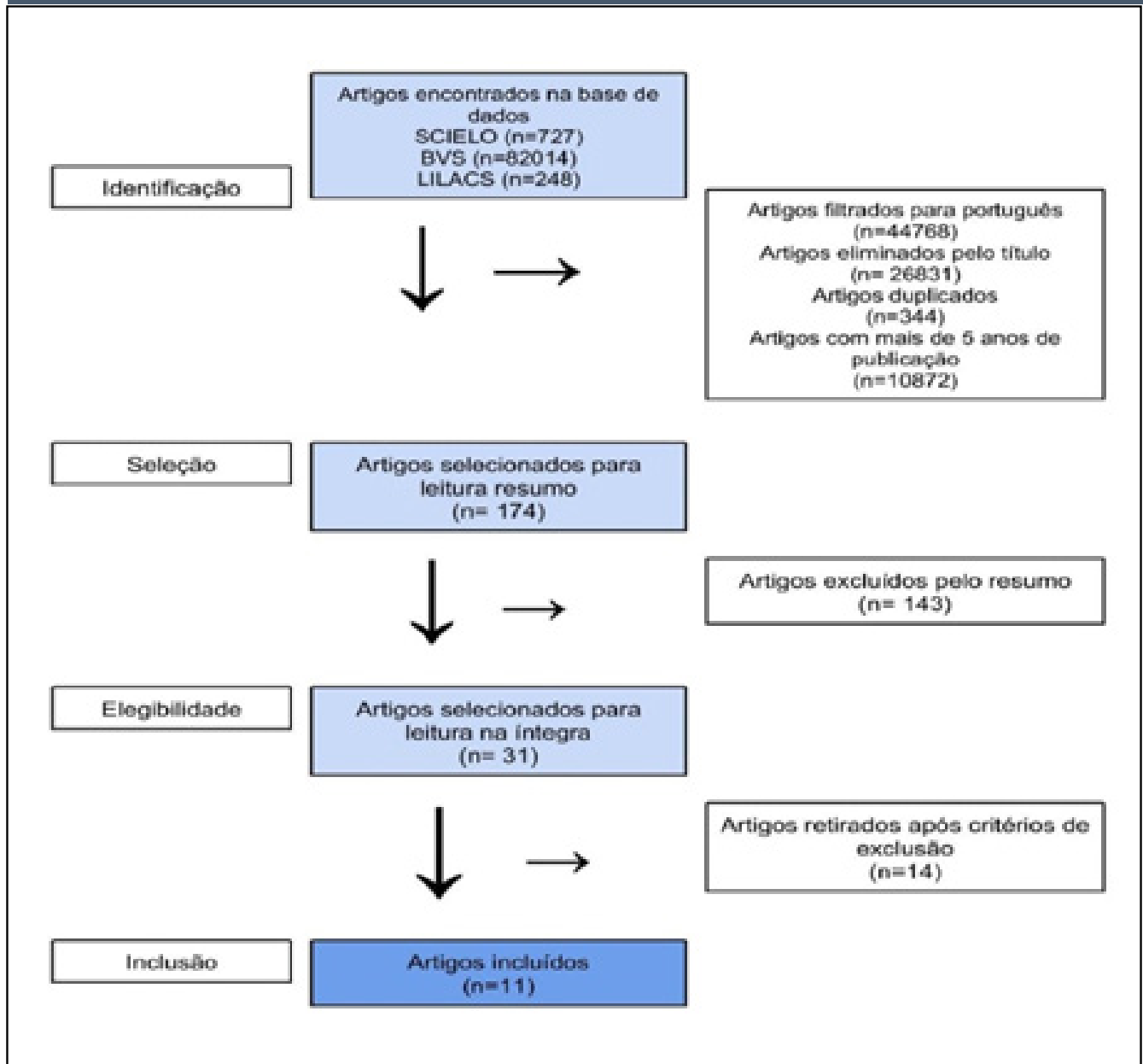
of human subjects, and submission to and approval by a Research Ethics Committee was therefore not required.

## RESULTS

A total of 82,989 records were initially identified, of which 174 articles proceeded to abstract review. After

exclusions, 31 studies were evaluated in full, resulting in 11 articles included in the final analysis. The selection flowchart followed the PRISMA recommendations (Figure 1).

Figure 1 – PRISMA flowchart according to eligibility criteria.



Source: Prepared by the authors (2025).

Table 1 presents the main data from the selected articles, including author, study type, physical therapy

interventions, and results. The interventions involved different types of physical exercises with pre- and post-intervention assessments, show-

ing improvements in balance, functionality, muscle strength, and a reduced risk of falls.

# Integrative Review

Golz MC, Morato WC, Oliveira F, Costa KAR, Fonseca PHN, Costa EE, Santos RC, Faria DA, Tavares PA  
 Physiotherapeutic Interventions in Fall Prevention in Parkinson's Disease: An Integrative Review

**Table 1. Summary of the studies collected on physical therapy for fall prevention in patients with Parkinson's disease. Divinópolis (MG), 2025.**

| Autor/Ano                    | Objective   | Type of Study                   | Interventions  | Results   |
|------------------------------|---|---------------------------------|--|---|
| Christofolletti et al., 2010 | To evaluate the effectiveness of physiotherapeutic intervention on balance in patients with PD.     | Controlled clinical trial       | Twelve participants with PD underwent a physiotherapy intervention program consisting of 60-minute sessions, conducted twice a week for 12 weeks. The program included specific exercises for static balance (maintaining postures) and dynamic balance (performing movements with displacement), focusing on improving postural control, gait, and fall prevention. | A protocol with active motor and cognitive stimulation demonstrated significant improvement in balance and mobility in patients with PD ( $p < 0.05$ ), even with a small sample size. These findings reinforce that intensive and well-structured physiotherapy programs are effective. Significant improvements were also observed in balance (Berg) and functional mobility (TUG) after six months of motor-cognitive physiotherapy intervention.  |
| Conradsson et al., 2015      | To assess the effects of highly challenging balance training in older adults with PD.               | Randomized clinical trial       | Experimental Group: performed highly challenging balance training with progressively complex activities.   | Control Group: usual routine or conventional exercises. Activities were performed for 60 minutes, 3 sessions/week, for 10 weeks.  |
| Silva et al., 2017           | To evaluate the effects of training with rhythmic auditory stimulation on gait in PD.               | Pilot randomized clinical trial | The experimental group performed step and gait training sessions with rhythmic auditory stimulation (such as beats or music with a constant rhythm) to synchronize steps. Duration: 2 to 3 sessions per week, 45 to 60 minutes, for 6 weeks. The control group performed conventional training without auditory stimuli.   | The use of rhythmic auditory stimulation (RAS) associated with physiotherapy showed significant improvements in gait parameters, such as speed, time, number of steps, and TUG (all with $p < 0.001$ ). Although no between-group differences were found in the pilot study, within-group results indicate that RAS may enhance the effects of conventional physiotherapy. These findings highlight its potential as a promising complementary resource, reinforcing the need for studies with larger samples and controlled comparisons. |
| Fernandes et al., 2018       | Clinical-epidemiological study to characterize patients with PD.                                    | Clinical study                  | Application of clinical protocols to collect sociodemographic data, motor and non-motor signs and symptoms, and functional assessment of patients with PD. There was no therapeutic intervention.  | Seventy-nine patients with Parkinson's disease, with a mean age of 66.7 years, predominantly male (69.6%), 52.9% mixed-race, and 46% with hypertension. Motor symptoms included tremor (93%) and rigidity (81%), while non-motor symptoms appeared in more than 20% of cases (depression). The majority (79.7%) used Levodopa+Benserazide, and 72.7% had access to physiotherapy, highlighting the urgency of early diagnosis and a multidisciplinary approach.   |
| Silva et al., 2019           | To assess the effects of mental practice associated with physiotherapy on gait and fall risk in PD. | Pilot study                     | The experimental group performed conventional motor physiotherapy sessions (gait, balance, and strengthening exercises) combined with mental practice (guided motor imagery). Two sessions per week were conducted, lasting 60 minutes each, for 6 weeks. The control group received only conventional physiotherapy.  | The inclusion of guided mental imagery practice in physiotherapy resulted in significant improvements in gait speed and cadence, as well as DGI scores ( $p = 0.02$ ), in patients with mild to moderate PD. There was a trend toward improvement in TUG time, 10-meter walk test (10MWT), and fall risk, but without statistical significance. Despite the small sample, the study suggests that motor imagery may be a promising and safe complement to enhance motor gains in gait.  |



|                       |  |                                      |  |   |
|-----------------------|--|--------------------------------------|--|---|
| WU, 2019              | To compare virtual reality and conventional physiotherapy in improving balance and gait in PD.   | Randomized controlled clinical trial | The experimental group performed rehabilitation sessions using virtual reality-mediated exercises (games and simulations for balance and gait). The control group performed conventional physiotherapy (traditional balance and gait exercises). Duration: 3 sessions per week, 45 minutes, for 6 to 8 weeks.  | Virtual reality (VR) rehabilitation over 12 weeks provided significantly greater improvements in balance, mobility, and functional gait compared to conventional physiotherapy ( $p < 0.05$ ), including a reduction in motor symptoms (UPDRS-III). When applied with adequate frequency, VR enhances neuroplasticity and postural control, representing an effective strategy in PD rehabilitation.  |
| Coban et al., 2021    | To investigate the effects of Pilates on balance and postural control in PD.   | Randomized clinical trial            | Pilates Group: supervised clinical Pilates sessions twice a week for 12 weeks, with an average duration of 60 minutes per session, focusing on stability, core strength, stretching, and postural control. Control Group: did not receive a specific intervention.   | Clinical Pilates promotes significant improvements in balance, strength, and mobility in patients with PD ( $p < 0.05$ ). Compared to conventional physiotherapy, the Pilates group showed superior dynamic balance ( $p < 0.05$ ), being equally effective in other parameters.  |
| Couto et al., 2023    | To describe epidemiological aspects, clinical manifestations, and treatments of PD.  | Case study                           | There was no practical intervention. This was a theoretical study presenting an overview of diagnosis, motor and non-motor symptoms, and pharmacological and non-pharmacological treatments, including physiotherapy.  | A comprehensive review reinforces the relevance of physiotherapy as a central component of the multidisciplinary approach in PD. Physiotherapeutic intervention, particularly through techniques focused on balance, gait, and strength, is essential to prevent falls, preserve mobility, and promote quality of life—confirming its indispensable role in the overall management of the disease.  |
| Albrecht et al., 2024 | To evaluate the effects of a highly challenging balance and gait training program (HiBalance) on motor function and brain structure in patients with PD. | Randomized clinical trial            | Ninety-five participants with PD were randomized into two groups: the HiBalance group and the active control group (speech and communication training). The HiBalance group participated in 1-hour group sessions twice a week for 10 weeks, with challenging balance and gait exercises, in addition to a weekly 1-hour home program. The control group performed speech and communication activities with the same frequency and duration. | No significant group $\times$ time interaction was found for balance or gait speed ( $p > 0.05$ ), but a significant increase in gait speed ( $p = 0.010$ ) and improvements in balance (Mini-BESTest: +2.2 vs. +0.94 in the control; $p < 0.001$ ) were observed in the HiBalance group. There was also an increase in left putamen volume ( $p < 0.001$ ) and a significant association between this volume and gait speed ( $R = 0.39$ ; $p = 0.026$ ). Despite limitations in the original RCT, clinical effects were evident and replicable in practical settings, with relevant structural and functional benefits. |
| Ge et al., 2024       | To compare home-based physiotherapy and telerehabilitation in motor function and quality of life in PD.  | Randomized clinical trial            | The home-based physiotherapy group performed supervised in-person sessions at home, while the telerehabilitation group performed the same activities with remote supervision via video calls. Both groups performed motor, balance, and stretching exercises, with a frequency of 3 sessions per week for 8 weeks, each session lasting an average of 45 minutes.  | Both groups showed significant improvements in motor symptoms (UPDRS-III), balance (BBS), mobility (TUG, FTSST), gait, and quality of life (PDQ-39). However, in older adults, the in-person group showed a reduction of -3.38 points in UPDRS-III vs -1.45 in the remote group ( $p = 0.021$ ), with better adherence (7% vs 13% dropout). The results highlight the feasibility of both models, with potential preference for home-based physiotherapy in older patients.   |
| Wong et al., 2024     | To analyze the effects of motor and cognitive training on obstacle walking in PD.  | Randomized clinical trial            | Combined training of motor and cognitive tasks involving walking through obstacle courses.   | Sessions were conducted 2 to 3 times per week, lasting approximately 45–60 minutes, for 6 to 8 weeks. Activities focused on motor planning, postural control, and attention during locomotion.  |

Source: Prepared by the authors (2025).

In summary, these studies confirm that structured, personalized programs—which incorporate multiple components such as strength, balance, mobility, and cognition—are essential for functional rehabilitation in PD. The effectiveness of these interventions is reflected in significant improvements in postural stability, walking speed and gait pattern, a reduction in the incidence of falls, and greater patient independence.

## DISCUSSION

The findings of this integrative review indicate that physical therapy has a consistent positive impact on functionality and fall prevention in people with Parkinson's disease, especially in the early and intermediate stages of the disease. In general, multimodal interventions demonstrated greater effectiveness when compared to conventional isolated protocols, suggesting that the combination of motor, cognitive, and sensory stimuli enhances functional gains and postural control.

The reviewed literature converges in pointing out that approaches such as motor-cognitive training, dual-task training, and virtual reality offer significant advantages in reducing the risk of falls, possibly by promoting greater sensorimotor integration and adaptation to functional demands similar to activities of daily living<sup>(10-12)</sup>. These results corroborate previous evidence that interventions simultaneously challenging the motor and cognitive systems favor the transfer of therapeutic gains to real-world contexts, a fundamental aspect of fall prevention.

Additionally, strategies such as rhythmic auditory stimulation and structured gait training have shown positive effects on step regularity, locomotor stability, and walking speed<sup>(13-15)</sup>. These findings reinforce the importance of interventions that use

external cues to compensate for deficits in automatic motor control, frequently observed in Parkinson's disease.

“ Clinical Pilates and mental practice associated with physical therapy have also stood out for contributing to muscle strengthening, body awareness, and the reduction of fear of falling, thereby enhancing functional autonomy<sup>(10,16)</sup>. ”

An analysis of the studies suggests that the effectiveness of physical therapy interventions is most pronounced in stages 1 through 3 of the disease, a period during which there is greater potential for motor adaptation and response to training. However, even in more advanced stages, physical therapy remains relevant in helping to maintain residual functions, prevent secondary complications, and promote comfort and functional safety<sup>(17-18)</sup>. In this context, telerehabilita-

tion has emerged as a viable alternative, especially in situations where access to in-person services is limited, yielding results comparable to conventional physical therapy, although with challenges related to adherence and the use of technology by older individuals<sup>(10,17)</sup>.

Despite the promising results, this review has limitations that must be considered. Notable among these are the heterogeneity of intervention protocols, variability in the duration and intensity of programs, the use of different instruments for assessing fall risk, and the small sample sizes in some of the included studies. Furthermore, the lack of long-term follow-up in many trials limits our understanding of the sustainability of the observed effects. These methodological limitations restrict the generalizability of the findings and underscore the need for more robust and standardized future clinical trials.

## CONCLUSION

The evidence reviewed indicates that structured, multimodal, and individualized physical therapy interventions are effective in improving balance and gait and reducing the risk of falls in people with Parkinson's disease. Strategies that integrate motor and cognitive components, as well as the use of technologies such as virtual reality and telerehabilitation, stand out as promising approaches in functional rehabilitation.

However, the methodological heterogeneity of the studies, combined with the scarcity of trials with larger sample sizes and long-term follow-up, limits the strength of the conclusions. Thus, future research should prioritize standardized study designs, representative samples, and longitudinal assessment of outcomes to consolidate robust evidence to support evidence-based clinical practice in fall prevention in this population.

## REFERENCES

1. Couto LC, Santos JF, Almeida RM, Pereira GS, Nogueira MS. Doença de Parkinson: epidemiologia, manifestações clínicas, fatores de risco, diagnóstico e tratamento. *Braz J Health Rev.* 2023;6(4):21743–21756.
2. Christofoletti G, Oliani MM, Gobbi S, Gobbi LTB, Stella F. Eficácia do tratamento fisioterapêutico no equilíbrio estático e dinâmico de pacientes com doença de Parkinson. *Rev Bras Fisioter.* 2010;13(5):423–429.
3. Coban F, Tekin L, Oskay D. Effect of clinical Pilates training on balance and postural control in patients with Parkinson's disease: a randomized controlled trial. *Fisioter Mov.* 2021;33:e003348.
4. Silva RA, Teixeira-Arroyo C, Gobbi LT. Step training and gait training with rhythmic auditory stimulation in Parkinson's disease: a randomized controlled pilot study. *Braz J Phys Ther.* 2017;24(1):50–56.
5. Whitemore R, Knafelz K. The integrative review: updated methodology. *J Adv Nurs.* 2005;52(5):546–553.
6. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ.* 2021;372:n71.
7. Ogrinc G, Davies L, Goodman D, Batalden P, Davidoff F, Stevens D. SQUIRE 2.0 (Standards for Quality Improvement Reporting Excellence): revised publication guidelines. *BMJ Qual Saf.* 2016;25(12):986–992.
8. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med.* 2009;6(7):e1000097.
9. Grant MJ, Booth A. A typology of reviews: an analysis of 14 review types and associated methodologies. *Health Info Libr J.* 2009;26(2):91–108. doi:10.1111/j.1471-1842.2009.00848.x.
10. Coban F, Tekin L, Oskay D. Effect of clinical Pilates training on balance and postural control in patients with Parkinson's disease: a randomized controlled trial. *Fisioter Mov.* 2021;33:e003348.
11. Albrecht F, Boldt R, Voigt M, et al. Challenging balance and gait training in Parkinson's disease. *Mov Disord.* 2019;34(3):394–403.
12. Conradsson D, Löfgren N, Nero H, et al. The effects of highly challenging balance training in elderly people with Parkinson's disease: a randomized controlled trial. *Neurorehabil Neural Repair.* 2015;29(9):827–836.
13. Silva RA, Teixeira-Arroyo C, Gobbi LT. Step training and gait training with rhythmic auditory stimulation in Parkinson's disease: a randomized controlled pilot study. *Braz J Phys Ther.* 2017;24(1):50–56.
14. Silva LP, Santos T, Oliveira J, et al. Effects of mental practice associated with motor physiotherapy on gait and risk of falls in Parkinson's disease: a pilot study. *Fisioter Pesqui.* 2019;27(1):65–71.
15. Dockx K, Bekkers EMJ, Van den Bergh V, et al. Virtual reality for rehabilitation in Parkinson's disease. *Cochrane Database Syst Rev.* 2016;12:CD010760.
16. Ge Y, Xie L, Yang Y, et al. Home-based physiotherapy versus telerehabilitation for improving motor function and quality of life in Parkinson's disease: a randomized clinical trial. *J Telemed Telecare.* 2024;28(3):174–181.
17. Couto LC, Santos JF, Almeida RM, Pereira GS, Nogueira MS. Doença de Parkinson: epidemiologia, manifestações clínicas, fatores de risco, diagnóstico e tratamento. *Braz J Health Rev.* 2023;6(4):21743–21756.
18. Fernandes I, Andrade Filho AS. Clinical-epidemiological study of patients with Parkinson's disease in Salvador, Bahia, Brazil. *Rev Bras Neurol.* 2018;56(2):25–30.
19. Wong PL, Yang YR, Cheng SJ, Lin KH, Wang RY. Effects of combined motor-cognitive training on obstacle negotiation and brain activation in people with Parkinson's disease: a randomized controlled trial. *Gait Posture.* 2024;77:191–197.
20. Wu Z, Chen J, Zhang S, et al. Virtual reality rehabilitation versus conventional physiotherapy to improve balance and gait in Parkinson's disease: a randomized controlled trial. *J Neuroeng Rehabil.* 2019;18(1):1–10.