Manual Therapy, Posturology & Rehabilitation Journal
ISSN: 2236-5435

REVIEW ARTICLE

The effects of Tai Chi Chuan on fall prevention in the elderly: Systematic Review

Gabriel L. Rosa, Rafael M. Larangeira

Max Planck University Center (UniMAX), Indaiatuba (SP), Brazil

Abstract

Background: Aging leads to a reduction in strength, changes in gait, and compromised balance, increasing the risk of falls and constituting a serious public health problem. Tai Chi Chuan (TCC) has proven effective in preventing these events in the elderly. **Objective:** Analyze the effectiveness of adapted forms of TCC as a method for fall prevention in the elderly. **Methods:** This is a systematic review of the literature. The databases PubMed, SciELO, LILACS, and Google Scholar were consulted. Randomized clinical trials (RCTs) published in English between January 1, 2015, and February 18, 2025, involving elderly individuals aged ≥60 who underwent adapted TCC interventions, compared to active or inactive controls, were included. Studies outside the topic, with insufficient methodological description, that were not RCTs, that recruited elderly individuals with prior experience in TCC, or with cognitive, neurological, or functional impairments, as well as special populations, were excluded. The studies were selected by two independent reviewers. The characteristics of the studies eligible to be included in this review were extracted and tabulated, likewise by two independent reviewers. The synthesis of the results was conducted thru narrative synthesis. The methodological characteristics and the effects of the interventions were analyzed and compared qualitatively. **Results:** Seven studies were included, totaling 1,017 elderly individuals. All the studies used adapted forms of TCC and demonstrated positive effects on factors related to fall risk. Only one RCT directly assessed the incidence of falls, recording a significant reduction after the TCC intervention. **Conclusion:** Adapted forms of TCC are effective in preventing falls in the elderly. However, overly simplified protocols or those with a frequency of more than four sessions per week reduce adherence and compromise the results. Future studies should adopt the incidence of falls as the primary outcome and rigorously monitor adherence and dropout.

Keywords: Tai Chi; elderly; accidental falls; postural balance.

Corresponding author: Gabriel Lopes Rosa
Email: gabriel.rosa122@outlook.com

Received: 04 Dez, 2025
Accepted: 25 Mar, 2026
Published: 07 Abr, 2026

BACKGROUND

Falls are among the leading causes of injuries, psychological declines, functional limitations, disability, and death in the elderly. In 2021, approximately 45.7 million falls were recorded, resulting in around 555,000 deaths among adults over 65 years old worldwide. Moreover, falls result in five times more hospitalizations than other injuries in this population, and nearly one-third of them require surgical intervention[1, 2]. Thus, falls generate significant costs for health and society, constituting a serious public health problem worldwide.

Falls are described as unexpected events in which a person ends up hitting the ground or a lower level. Their causes are generally multifactorial, ranging from difficulty in correcting body displacement during movement in space, resulting from sensorimotor deficits, to environmental factors[3]. Furthermore, most of these episodes are strongly associated with age-related changes, such as loss of muscle strength, impaired postural control, reduced performance in simultaneous tasks, fear of falling, and depressive symptoms[1, 4-8].

However, falls are preventable, and exercise-based interventions have proven to be effective strategies in preventing these events. However, identifying the best preventive interventions is a challenge, as there are various types of exercises[9]. Among the various types of strategies used in the prevention of this complex condition, Tai Chi Chuan (TCC) stands out, a Chinese martial art in which practitioners perform smooth and continuous movements, associated with deep breathing and mental concentration, for therapeutic purposes and not for combat. It is considered a low to moderate intensity activity, being regarded as a safe exercise for the elderly[10, 11].

Scientific research has demonstrated significant benefits of practicing Tai Chi in preventing falls in the elderly. Penn et al.[12], after subjecting elderly individuals aged 65 and older from a community in Taiwan to Tai Chi practice, observed significant improvements in balance and lower limb muscle strength, contributing to the prevention of accidental falls. Moreover, Tai Chi Chuan has proven to be more effective than other exercise programs with the same purpose, as demonstrated in the study by Yıldırım et al.[13], which compared the effects of this practice with combined exercises over a period of 12 weeks. The elderly who practiced TCC showed better performance in static balance, less fear of falling, and better emotional state compared to those who performed combined exercises.

Although previous studies have shown promising results in fall prevention among the elderly, there are still gaps regarding the generalization of the effectiveness of TCC in fall prevention among the elderly, mainly due to the complexity of the movements involved, which can compromise participants' adherence to the exercise. It is known that adapted versions of the practice tend to favor greater participation and continuity among the elderly; however, it is still uncertain to what extent these simplified forms maintain the same efficacy as traditional versions in fall prevention, as well as to what degree they contribute to improving adherence among practitioners[14].

This scenario, combined with the significant increase in the elderly population and the rising incidence of falls in this demographic, makes it essential to conduct a systematic analysis on fall prevention in the elderly, in order to consolidate the evidence and provide support for clinical practice and future research.

The main objective of this systematic review was to analyze the effectiveness of adapted forms of TCC as a method for fall prevention in the elderly. The specific objectives include: 1) Analyzing the effects of adapted forms of TCC on the incidence of falls; 2) Analyzing the effects of adapted forms of TCC related to the determinants of falls, such as balance, muscle strength, postural control, dual-task performance, fear of falling, and depressive symptoms; and 3) Investigating the adherence to the adapted TCC protocols of the included studies, identifying the factors or reasons reported for participants' dropout.

METHODS

This is a systematic literature review, conducted based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines.

Data sources and research

The databases PubMed, SciELO, LILACS, and Google Scholar were consulted. The search was structured using boolean operators, employing the following combination: (tai chi OR taiji OR taijiquan) AND (elderly OR postural balance OR fall risk OR falls). The following search filters were applied: a) Study type: randomized clinical trial; b) Language: English; c) Publication period: from 2015 to 2025.

Inclusion and exclusion criteria

Randomized clinical trials published in English between January 1, 2015, and February 18, 2025, involving elderly individuals aged 60 or older subjected to adapted TCC interventions, compared to active or inactive controls, were included. The outcomes evaluated were the incidence of falls and fall determinants, measured thru tests such as Timed Up and Go (TUG), Center of Pressure (COP), Berg Balance Scale, Geriatric Depression Scale, dual-task performance, single-leg support performance, geriatric depression scale, and questionnaires on fear of falling.

Studies that were not relevant to the topic, had insufficient methodological description, or were not randomized clinical trials were excluded, as well as those that recruited elderly individuals with prior experience in TCC, cognitive, neurological, or functional impairments, as well as special populations.

Selection of studies and extraction of their characteristics

All records identified in the databases were initially assessed for eligibility based on titles and abstracts, following the predefined inclusion and exclusion criteria. Subsequently, the full texts of potentially eligible articles were retrieved for detailed analysis.

Characteristics of the studies considered eligible to be included in this review, such as author and year, type of study, sample, intervention and control group, duration and frequency, outcomes evaluated, and results, were extracted and tabulated.

All these steps were carried out by two reviewers and independently. Any discrepancies between the reviewers were resolved by consensus.

Summary of the results

The results were synthesized thru narrative synthesis, organizing the studies according to the main outcomes evaluated. The methodological characteristics and the effects of the interventions were compared qualitatively.

RESULTS

As a result, 69 articles were identified, of which 48 were excluded for not meeting the research criteria, as identified solely by reading the titles. Thus, 21 were selected for the next stage.

Next, a screening was conducted based on a thorough reading of the summaries of these records, which resulted in the exclusion of 6 of them that did not meet the established criteria. In this way, 15 studies were selected for full reading. The full text of these records was read and evaluated according to the inclusion and exclusion criteria. At the end of this process, 7 articles were deemed suitable to be included in this systematic review (Figure 1).

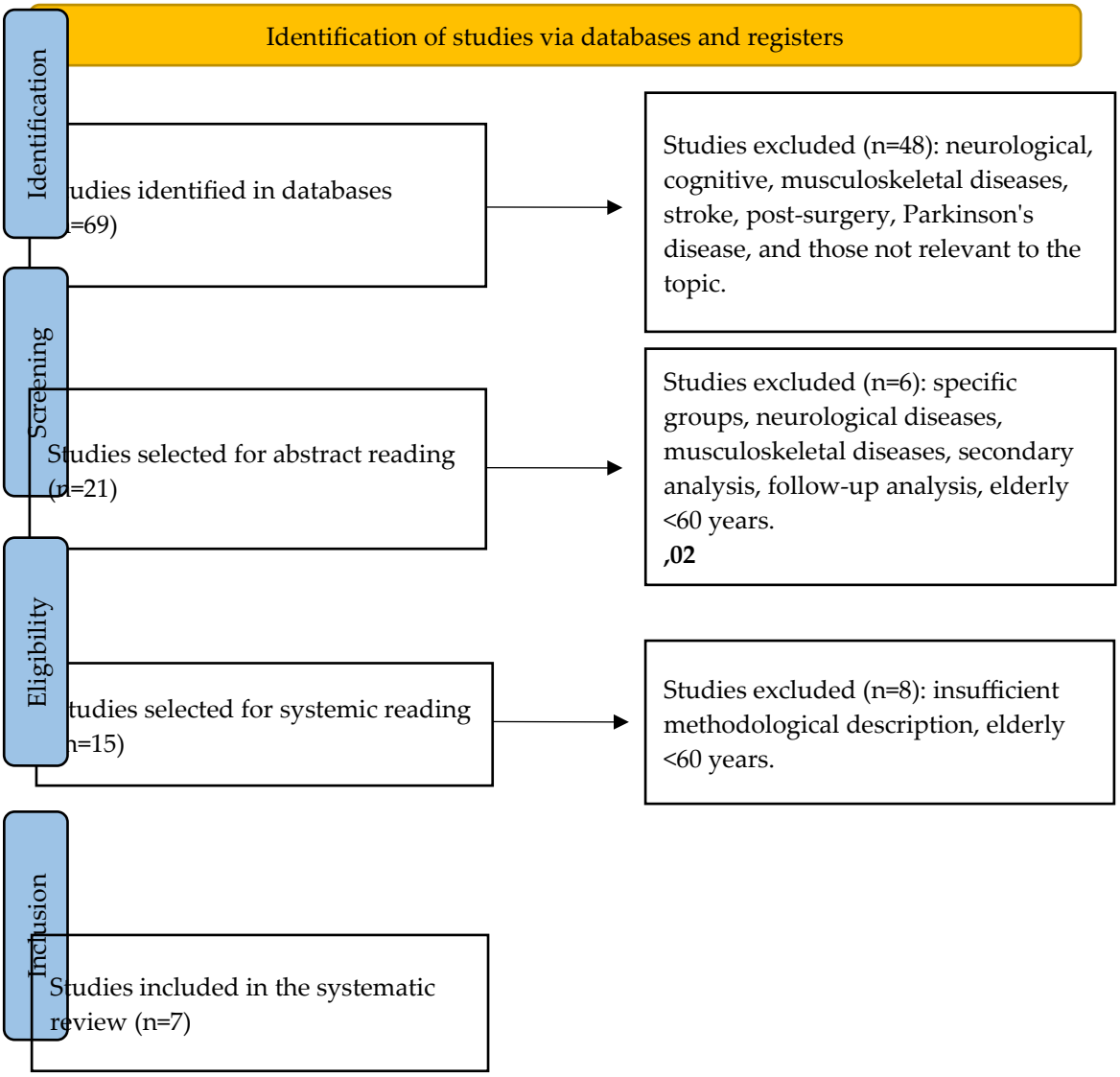

Figure 1. Flowchart of the study selection process for systematic review

After the final selection of the included studies, it became necessary to synthesize their characteristics and results. In this way, a table (Table 1) was created to present the main information of each study, including the author and year, type of study, sample, intervention and control group, duration and frequency, assessed outcomes, and results.

The synthesis and extraction of data were carried out by two reviewers independently, and any discrepancies were resolved by consensus.

Table 1. Characteristics of the studies included in the systematic review on TCC in the prevention of falls in the elderly

Author, year	Sample	Main intervention	Duration and frequency	Control group	Outcomes assessed	Results
Li et al.[9]	670 participants	Intervention A: Tai Ji Quan: Moving for Better Balance (TJQMBB) Intervention B: Multimodal exercises (aerobic, strength, balance, and flexibility activities)	Twice per week for 24 weeks	Stretching	Fall incidence, TUG, functional reach, physical performance, cognitive assessment	TJQMBB and multimodal exercises showed better outcomes than the control group across all outcomes; TJQMBB was associated with a lower incidence of falls per person and was more effective in preventing injurious falls compared with multimodal exercises
Mao et al.[14]	102 participants	Eight-form TCC Tai Chi LEE	Four times per week for 16 weeks	Stretching	BBS, TUG and center of pressure (COP) measures	BBS, TUG, and COP measures in the eight-form TCC and Tai Chi LEE groups were superior to those in the control group; Tai Chi LEE was significantly superior to eight-form Tai Chi Chuan in TUG performance
Lu et al. [15]	31 participants	12-form Yang-style TCC	Three times per week for 16 weeks	General interest classes	Auditory Stroop test and COP measures	The Tai Chi Chuan group showed significant improvements in dual-task balance, with fewer errors on the dual-task Stroop test and a smaller COP area under dual-task conditions compared with the control group
Sun et al.[16]	Randomized controlled trial	48 participants	Intervention A: 24-form Tai Chi Chuan (TCC) Intervention B: Brisk walking (BW)	Five times per week for 16 weeks	No structured physical activity	SLO, SLC, SLS time, and COP measures
Kim et al.[17]	Randomized controlled trial	46 participants	Intervention A: 21-form Sun-style TCC Intervention B: Taekkyeon	Twice per week for 12 weeks	-	TUG, FR, OLS, Five Times Sit-to-Stand (5xSTS), 30-Second Sit-to-Stand (30s-STS), and gait parameters
Hu et al.[18]	Randomized controlled trial	55 participants	Eight methods and five steps of TCC	Four times per week for 16 weeks	Watching TV and reading newspapers	COP variables, proprioception, and plantar tactile sensitivity
Ge et al.[19]	Randomized controlled trial	65 participants	Eight-form TCC	Three times per week for 8 weeks	Usual daily activities	CRT, WS, FOF, GDS

Note: BBS – Berg Balance Scale; TUG – Timed Up and Go Test; COP – Center of Pressure; CRT – 30-s chair rise test; WS – Walking Speed; FOF – Fear of Falling; GDS – Geriatric Depression Scale; FR – Functional Reach Test; OLS – Single-Leg stance; 5×STS – 5 times sit-to-stand test; 30s STS – 30 seconds sit-to-stand test; SLO – Single-Leg stance with Open eyes; SLC – Single-Leg stance with Closed eyes; SLS time – Single-Leg Stance time.

DISCUSSION

The present systematic review analyzed randomized clinical trials that investigated the effects of TCC on fall prevention in the elderly. Of the included studies, approximately 85.7% showed improvements in factors considered determinants for falls, such as balance, muscle strength, postural control, performance in dual tasks, fear of falling, and depressive symptoms[14-19]. Furthermore, 14.3% of the studies showed a direct reduction in the incidence of falls and also in factors considered determinants for falls[9], reinforcing that the practice of TCC can play a significant role in preventing these events in the elderly population.

Regarding the actual incidence of falls, only one study[9] used the incidence of falls as a primary outcome, demonstrating that the intervention with an adapted therapeutic form of TCC (Tai Ji Quan: Moving for Better Balance – TJQMBB) was more effective in reducing falls per person and preventing falls with injuries, when compared to the practice of multimodal exercises and a control group, making it the most effective strategy among the evaluated approaches. Moreover, other outcomes related to falls in the elderly, such as the Timed Up and Go (TUG), functional reach, physical performance, and cognitive assessments, were also investigated, and although the results were significantly better compared to the control group, they were similar when compared to the multimodal exercise group.

In outcomes related to postural balance measured by force platform, several studies[14,15,16,18] indicate improvements in center of pressure (COP) control, a factor directly associated with balance and fall prevention in the elderly[20]. Lu et al.[15], for example, investigated the COP during step descent under simple and dual-task conditions, after practicing 12 forms of Yang-style Tai Chi. The authors observed significant reductions in both the area of sway and the trajectory of the COP, in a simple task and when associated with an auditory stimulus.

Such results are particularly relevant considering that dual-task balance performance has been used as a predictor of falls in the elderly[5] and that more than 10% of fatal accidents in this population occur during stair descent, an activity that generally requires the integration of multiple sensory, motor, and cognitive stimuli[8]. Thus, the findings suggest that the practice of TCC may favor the integration between motor control and cognitive demands in challenging everyday situations, establishing itself as an effective strategy in fall prevention.

Similarly, Sun et al.[16] evaluated the COP in unipodal support and identified reductions in trajectory length, ellipse area, and anteroposterior and mediolateral displacements in the group practicing 24 forms of TCC, compared to fast walking practitioners, whose improvements occurred at a later stage. Additionally, Hu et al. (18) found that the practice of the Eight Methods and Five Stages Tai Chi, a reduced and adapted version of the traditional forms, promoted consistent gains in the square root and average speed of the COP with eyes closed, although not all evaluated conditions showed significant differences.

Furthermore, the authors highlighted the contribution of TCC to proprioception and plantar tactile sensitivity, with more pronounced gains in knee proprioception and arch sensitivity, with no observed effect on the ankle.

Regarding functional balance, Sun et al.[16] demonstrated that the single-leg stance (OLS) time significantly increased after 8 to 12 weeks of practicing 24 forms of Taijiquan, especially with eyes open, with later gains observed in the eyes-closed condition.

Complementarily, Kim et al.[17] also observed improvements in the One-Leg Stand Test (OLS), the Functional Reach (FR), and the Timed Up and Go (TUG) in both practitioners of 21 forms of Tai Chi in the Sun style and Taekkyon, with Tai Chi standing out for showing superior results specifically in the OLS. These findings reinforce the relevance of this practice in improving postural control in single-leg support tasks, a component closely associated with the risk of falls[4].

Moreover, in the study by Kim et al.[17], the sit-to-stand tests (5xSTS and 30s-STS) were used to assess lower limb strength, considered a clinically important and statistically significant risk factor for falls[7].

At the end of the study, the authors identified that the practice of 21 forms of Tai Chi in the Sun style was able to significantly improve the lower limb muscle strength of the participants. In parallel, the study by Ge et al.[19] demonstrated that the practice of 8 forms of Tai Chi in the Yang style is also capable of significantly improving the lower limb muscle strength and walking speed of pre-frail elderly individuals, in addition to reducing the fear of falling and improving the participants' mood, factors considered determinants in the occurrence of falls in the elderly[6].

When comparing two adapted forms of Tai Chi, Mao et al.[14] highlighted the effects of a simplified traditional form of 8 movements and an even more reduced version, focused exclusively on the lower limbs (Tai Chi Lower Extremity Exercise – TC LEE).

Both protocols resulted in significant improvements in balance (assessed by the Berg Balance Scale), functional mobility (through the Timed Up and Go), and static postural control (measured by the center of pressure – COP), when compared to the stretching control group. However, the TC LEE showed superior performance in the TUG, suggesting a greater impact on functional mobility. This result may be related to the fact that the absence of upper limb movements requires greater neuromuscular precision and body weight control solely by the lower limbs, simulating everyday situations where the arms are occupied (for example, when carrying objects).

However, the study presented a considerable dropout rate before completion, when compared to the other studies, especially in the TC LEE group, which may compromise the interpretation of the results and require caution in generalizing the conclusions.

In addition to the efficacy in clinical outcomes, the importance of participant adherence is highlighted. In general, the reviewed studies opted to use adapted forms of TCC, whether thru shortened sequences, therapeutic protocols, or simplified versions of traditional styles (Yang, Sun, or short forms).

This methodological choice was justified by some authors as a strategy to promote adherence, making learning more accessible, less exhausting, and suitable for the functional capacities of the elderly population. In fact, studies that employed adapted, simplified, or therapeutic forms of TCC[9,15,17,19].

In the study by Ge et al.[19], 13% of the participants in the intervention group dropped out before completion, with the reasons not disclosed by the authors. On the other hand, in the study by Kim et al.[17], 8% of the participants dropped out of the intervention before completion, with the reasons being due to unstable medical conditions.

Meanwhile, in the studies by Lu et al.[15] and Li et al.[9], 13% of the participants in the intervention group dropped out of the study before completion. In the first study, one had insufficient attendance and the other did not show up for the evaluation after the intervention; the causes of absenteeism and absence on the final evaluation day were not revealed by the authors. In the second study, 26 of the participants reported health/illness problems, 3 stated a lack of time, and only one showed disinterest.

In contrast, longer protocols with a higher frequency of practice per week (more than 4 times/week)[16,18] recorded higher dropout rates in the intervention groups. In the study by Sun et al.[16], 25% of the participants dropped out before completion, with reasons including health issues, low attendance rate, lack of available time, and no apparent reason. Although the reasons for dropout were stated by the participants, the authors did not clarify the reasons by group. On the other hand, in the study by Hu et al.[18], 46.4% of the participants dropped out before completion, with the majority citing insufficient attendance.

The other reasons were not well clarified by the authors, nor were the reasons by group revealed. Similarly, very reduced forms of TCC, with extremely simplified movements, can also become monotonous and lead to dropouts, as observed by Mao et al.[14] in the study with TC LEE, demonstrating that both excessive complexity and extreme simplification can negatively impact participant adherence. In the study, 27.5% of the participants dropped out of the protocol before completion, the reasons being: health issues and loss of interest.

These findings, in line with previous scientific evidence, suggest that TCC offers significant benefits in determining factors of falls and in reducing their incidence. However, adherence of the elderly to the practice can be challenging, with program adequacy being essential factors to maintain the engagement of these participants[21-24].

Future studies could expand the sample size, use more active controls, such as other exercise modalities, and define the incidence of falls as the main outcome. Furthermore, a more rigorous control of dropout rates is recommended, including the analysis of reasons, in order to strengthen methodological quality, assess participant adherence, and verify the feasibility of TCC as a strategy for fall prevention.

Despite the findings of this systematic literature review, its methodological limitations are acknowledged. It is recommended that future studies assess the risk of bias in the included systematic reviews, using specific tools developed for this purpose and strictly following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines.

CONCLUSION

In summary, the studies analyzed indicate that adapted forms of TCC promote significant benefits in factors considered determinants for falls, such as balance, muscle strength, postural control, performance in dual tasks, fear of falling, and depressive symptoms, and consequently, for the prevention of falls in the elderly. However, the participants' engagement directly depends on the characteristics of the protocols used: excessively shortened versions tend to become monotonous and compromise adherence, as well as protocols with a higher frequency of practice (more than 4 times/week).

Although other exercise modalities may also promote significant benefits in factors considered determinants for falls, these gains for the effective reduction of falls seem to be more consistent in the practice of adapted TCC protocols.

It is suggested that future studies expand the sample size, use more active controls, prioritize the incidence of falls as the main outcome, and adopt more rigorous monitoring of dropout rates. Furthermore, it is recommended that future systematic reviews consider the risk of bias in studies and the rigorous application of PRISMA guidelines, in order to strengthen the methodological quality of investigations on TCC in the prevention of falls in the elderly.

Author Contributions: G.L.R.: Contributed to the conception and design of the study and contributed tointerpretation of functional outcomes; R.M.L: Contributed to statistical analysis anddata interpretation and manuscript drafting; and all authors contributed to critical revision of the manuscript for important intellectual content and approvedthe final version to be published.
Financial Support: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.
Conflict of interest: The authors declare no conflict of interest.

REFERENCES

1. Salari N, Darvishi N, Ahmadipanah M, Shohaimi S, Mohammadi M. Global prevalence of falls in the older adults: a comprehensive systematic review and meta-analysis. J Orthop Surg Res. 2022 Jun 28;17(1):334. doi: 10.1186/s13018-022-03222-1. PMID: 35765037; PMCID: PMC9238111.

2. Chen Y, Dai F, Huang S, Qi D, Peng C, Zhang A, Wang Y, Gu Y, Guo J. Global, regional, and national burden of falls among older adults: findings from the Global Burden of Disease Study 2021 and Projections to 2040. NPJ Aging. 2025 Oct 9;11(1):85. doi: 10.1038/s41514-025-00275-4. PMID: 41068164; PMCID: PMC12511421.

3. Gonçalves ICM, Freitas RF, Aquino EC, Carneiro JA, Lessa ADC. Mortality trend from falls in Brazilian older adults from 2000 to 2019. Rev Bras Epidemiol. 2022 Oct 24;25:e220031. Portuguese, English. doi: 10.1590/1980-549720220031.2. PMID: 36287517.

4. Enderlin C, Rooker J, Ball S, Hippensteel D, Alderman J, Fisher SJ, McLeskey N, Jordan K. Summary of factors contributing to falls in older adults and nursing implications. Geriatr Nurs. 2015 Sep-Oct;36(5):397-406. doi: 10.1016/j.gerinurse.2015.08.006. Epub 2015 Sep 3. PMID: 26343008.

5. Faulkner KA, Redfern MS, Cauley JA, Landsittel DP, Studenski SA, Rosano C, Simonsick EM, Harris TB, Shorr RI, Ayonayon HN, Newman AB; Health, Aging, and Body Composition Study. Multitasking: association between poorer performance and a history of recurrent falls. J Am Geriatr Soc. 2007 Apr;55(4):570-6. doi: 10.1111/j.1532-5415.2007.01147.x. PMID: 17397436.

6. McKay MA, Copel L. Factors associated with health-related quality of life in PACE participants. Geriatr Nurs. 2021 Jan-Feb;42(1):145-150. doi: 10.1016/j.gerinurse.2020.12.011. Epub 2021 Jan 6. PMID: 33418358.

7. Moreland JD, Richardson JA, Goldsmith CH, Clase CM. Muscle weakness and falls in older adults: a systematic review and meta-analysis. J Am Geriatr Soc. 2004 Jul;52(7):1121-9. doi: 10.1111/j.1532-5415.2004.52310.x. PMID: 15209650.

8. Startzell JK, Owens DA, Mulfinger LM, Cavanagh PR. Stair negotiation in older people: a review. J Am Geriatr Soc. 2000 May;48(5):567-80. doi: 10.1111/j.1532-5415.2000.tb05006.x. PMID: 10811553.

9. Li F, Harmer P, Fitzgerald K, Eckstrom E, Akers L, Chou LS, Pidgeon D, Voit J, Winters-Stone K. Effectiveness of a Therapeutic Tai Ji Quan Intervention vs a Multimodal Exercise Intervention to Prevent Falls Among Older Adults at High Risk of Falling: A Randomized Clinical Trial. JAMA Intern Med. 2018 Oct 1;178(10):1301-1310. doi: 10.1001/jamainternmed.2018.3915. PMID: 30208396; PMCID: PMC6233748.

10. Chewning B, Hallisy KM, Mahoney JE, Wilson D, Sangasubana N, Gangnon R. Disseminating Tai Chi in the Community: Promoting Home Practice and Improving Balance. Gerontologist. 2020 May 15;60(4):765-775. doi: 10.1093/geront/gnz006. PMID: 30811543; PMCID: PMC7228442.

11. Nyman SR, Ingram W, Sanders J, Thomas PW, Thomas S, Vassallo M, Raftery J, Bibi I, Barrado-Martín Y. Randomised Controlled Trial Of The Effect Of Tai Chi On Postural Balance Of People With Dementia. Clin Interv Aging. 2019 Nov 19;14:2017-2029. doi: 10.2147/CIA.S228931. PMID: 31819385; PMCID: PMC6875562.

12. Penn IW, Sung WH, Lin CH, Chuang E, Chuang TY, Lin PH. Effects of individualized Tai-Chi on balance and lower-limb strength in older adults. BMC Geriatr. 2019 Aug 27;19(1):235. doi: 10.1186/s12877-019-1250-8. PMID: 31455225; PMCID: PMC6712673.

13. Yıldırım P, Ofluoglu D, Aydogan S, Akyuz G. Tai Chi vs. combined exercise prescription: A comparison of their effects on factors related to falls. J Back Musculoskelet Rehabil. 2016 Aug 10;29(3):493-501. doi: 10.3233/BMR-150645. PMID: 26519119.

14. Mao M, Mercer VS, Li F, Gross MT, Blackburn T, Yu B. The effect of Tai Chi lower extremity exercise on the balance control of older adults in assistant living communities. BMC Complement Med Ther. 2024 Mar 6;24(1):112. doi: 10.1186/s12906-024-04382-9. PMID: 38448853; PMCID: PMC10918873.

15. Lu X, Siu KC, Fu SN, Hui-Chan CW, Tsang WW. Effects of Tai Chi training on postural control and cognitive performance while dual tasking - a randomized clinical trial. J Complement Integr Med. 2016 Jun 1;13(2):181-7. doi: 10.1515/jcim-2015-0084. PMID: 27003242.

16. Sun W, Ma X, Wang L, Zhang C, Song Q, Gu H, Mao D. Effects of Tai Chi Chuan and Brisk Walking Exercise on Balance Ability in Elderly Women: A Randomized Controlled Trial. Motor Control. 2019 Jan 1;23(1):100-114. doi: 10.1123/mc.2017-0055. PMID: 30008242.

17. Kim CY, Je HD, Jeong H, Jeong JH, Kim HD. Effects of Tai Chi versus Taekkyon on balance, lower-extremity strength, and gait ability in community-dwelling older women: A single-blinded randomized clinical trial. J Back Musculoskelet Rehabil. 2020;33(1):41-48. doi: 10.3233/BMR-181493. PMID: 31282402.

18. Hu X, Lyu S, Mao M, Zhang J, Sun W, Zhang C, Song Q. Effects of Eight Methods and Five Steps of Tai Chi Practice on Balance Control Among Older Adults. Motor Control. 2021 Sep 16;25(4):616-630. doi: 10.1123/mc.2021-0022. PMID: 34530402.

19. Ge Y, Liu H, Wu Q, Chen A, Gao Z, Xing F, Liu G. Effects of a short eight Tai Chi-forms for the pre-frail elderly people in senior living communities. Physiother Theory Pract. 2022 Dec;38(12):1928-1936. doi: 10.1080/09593985.2021.1926023. Epub 2021 Jun 2. PMID: 34076569.

20. Zhou J, Chang S, Cong Y, Qin M, Sun W, Lian J, Yao J, Li W, Hong Y. Effects of 24 weeks of Tai Chi Exercise on Postural Control among Elderly Women. Res Sports Med. 2015;23(3):302-14. doi: 10.1080/15438627.2015.1040918. Erratum in: Res Sports Med. 2015;23(4):424. doi: 10.1080/15438627.2015.1080897. PMID: 26223978.

21. Kim H, Kim YL, Lee SM. Effects of therapeutic Tai Chi on balance, gait, and quality of life in chronic stroke patients. Int J Rehabil Res. 2015 Jun;38(2):156-61. doi: 10.1097/MRR.0000000000000103. PMID: 25591053.

22. Liu H, Frank A. Tai chi as a balance improvement exercise for older adults: a systematic review. J Geriatr Phys Ther. 2010 Jul-Sep;33(3):103-9. PMID: 21155504.

23. Song Q, Tian X, Wong D, Zhang C, Sun W, Cheng P, Mao D. Effects of Tai Chi Exercise on body stability among the elderly during stair descent under different levels of illumination. Res Sports Med. 2017 Apr-Jun;25(2):197-208. doi: 10.1080/15438627.2017.1282363. Epub 2017 Feb 16. PMID: 28367687.

24. Yeung A, Lepoutre V, Wayne P, Yeh G, Slipp LE, Fava M, Denninger JW, Benson H, Fricchione GL. Tai chi treatment for depression in Chinese Americans: a pilot study. Am J Phys Med Rehabil. 2012 Oct;91(10):863-70. doi: 10.1097/PHM.0b013e31825f1a67. PMID: 22790795.