

Using Artificial Intelligence to Conduct Medical Research on Applications of Tai Chi and Qigong: A Case Study of Multiple Sclerosis

Robert W McGee*

Fayetteville State University, School of Business and Economics, USA

*Corresponding author: Robert W McGee, Fayetteville State University School of Business and Economics, NC 28301, USA

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ABSTRACT

Background: Artificial intelligence (AI) is increasingly integral to medical research, offering potential to streamline the synthesis of complex data. This study evaluates AI's capability to summarize research on the use of Tai Chi and Qigong—Traditional Chinese Medicine practices involving mindful, gentle movements—for treating multiple sclerosis (MS), a chronic autoimmune disease of the central nervous system.

Methods: A PubMed search identified 16 studies (2004–March 13, 2025) investigating Tai Chi and Qigong in MS patients. Grok3, an AI assistant, was tasked with summarizing these studies' results and identifying specific techniques employed.

Results: The AI analysis revealed that Tai Chi and Qigong significantly improve balance, fatigue, mood, physical function, and quality of life in MS patients. Primary studies (e.g., Burschka, et al. [1,2]) and systematic reviews (e.g., Shi, et al. [3,4]) consistently reported benefits, with Yang-style Tai Chi frequently cited for its slow, flowing movements. Qigong, emphasizing breathing and adaptability, was less specific in style (e.g., Buttolph, et al. [5,6]). Limitations included small sample sizes, variable intervention durations, and inconsistent technique reporting, hindering precise replication.

Conclusions: Grok3 effectively summarized the studies, demonstrating AI's utility in synthesizing medical research. However, detailed technique disclosure (e.g., specific forms like Yang 24 or Baduanjin) was limited, suggesting human review or direct researcher contact for deeper insights. While AI summarization enhances efficiency, it remains an intermediate step, necessitating further in-depth analysis for rigorous MS research advancement.

Keywords: Artificial Intelligence; Grok3 Tai Chi; Qigong; Traditional Chinese Medicine; TCM; Medical Research; Multiple Sclerosis; Neurological Disorders

Introduction

Artificial intelligence (AI) has become increasingly valuable in medical research in recent years. As it continues to improve and become more sophisticated, the number of applications has increased [1-17]. The present study explores the use of AI in Multiple Sclerosis research. Specifically, this study investigates the degree to which AI is capable of summarizing existing research, using Multiple Sclerosis as a case study. The subfield of MS research investigated in this study is the use of tai chi and qigong, two tools in the toolbox of Traditional Chinese Medicine [TCM], to treat MS patients [18-33]. Tai chi and

qigong have many common features. They are both forms of moving meditation that involve mindfulness and slow, gentle movements. Historical records indicate that qigong has been used to treat a wide range of maladies for several thousand years. Tai chi is much younger, going back to the thirteenth century, or perhaps earlier [34-41].

Methodology & Results

The PubMed database was searched to find studies that had been conducted on the use of either tai chi or qigong to treat individuals who had multiple sclerosis. The period covered was 2004 to March 13, 2025. Sixteen relevant studies were found. Grok3, an artificial in-

telligence assistant, was then instructed to discuss and summarize the results of those studies, and to identify which specific tai chi or qigong techniques were used in those studies.

Grok Reply

Below is a discussion and summary of the results from the listed studies regarding the effects of Tai Chi and Qigong on individuals with multiple sclerosis (MS), including details on the specific techniques used when disclosed in the studies. The studies collectively explore the impact of these traditional Chinese exercises on physical, psychological, and quality-of-life outcomes in MS patients.

Summary of Study Results

1. Azimzadeh, et al. [24]
 - o Focus: Effect of Tai Chi Chuan on balance in women with MS.
 - o Results: The study found that Tai Chi significantly improved balance compared to a control group, as measured by the Berg Balance Scale.
 - o Techniques: The study used “Tai Chi Chuan” but did not specify a particular style (e.g., Yang, Chen). It involved a 12-week intervention with sessions twice weekly for 60 minutes.
 - o Disclosure: Limited detail on specific movements; focused on general Tai Chi practice.
2. Bowling [25]
 - o Focus: Review of complementary and alternative medicine (CAM) in MS, including Tai Chi.
 - o Results: Tai Chi was noted as a promising CAM approach for improving balance and reducing fatigue, though evidence was preliminary.
 - o Techniques: No specific Tai Chi style or protocol mentioned; discussed as a general mind-body practice.
 - o Disclosure: Broad overview, not a primary study, so no detailed intervention specifics.
3. Burschka, et al. [1]
 - o Focus: Effects of Tai Chi on balance, coordination, fatigue, and depression in MS patients.
 - o Results: Significant improvements were observed in balance (measured by static posturography), coordination, fatigue, and depressive symptoms after a 6-month intervention.
 - o Techniques: Used a standardized Tai Chi program based on the Yang style, with 90-minute weekly sessions.
 - o Disclosure: Specified Yang-style Tai Chi, focusing on slow, controlled movements.
4. Buttolph, et al. [6]
 - o Focus: Participant perspectives on community Qigong for MS.
 - o Results: Participants reported improved energy, mood, and social connection, with qualitative data highlighting Qigong’s feasibility and acceptability.
 - o Techniques: Community-based Qigong, not tied to a specific style; emphasized gentle movements and breathing exercises.
 - o Disclosure: General Qigong practice, no specific forms detailed.
5. Buttolph, et al. [5]
 - o Focus: Feasibility of community Qigong for MS patients.
 - o Results: The study confirmed Qigong’s feasibility, with improvements in fatigue, mood, and quality of life after an 8-week program.
 - o Techniques: Community-delivered Qigong, focusing on accessible movements and breathing, but no specific style (e.g., Eight Brocades) named.
 - o Disclosure: General Qigong, tailored for MS patients’ mobility levels.
6. Buttolph, et al. [26]
 - o Focus: Survey of key Qigong components for MS from clinicians, researchers, and instructors.
 - o Results: Identified breathing, slow movements, and mindfulness as core components beneficial for MS symptom management.
 - o Techniques: No specific Qigong style; emphasized adaptable, low-impact exercises.
 - o Disclosure: Conceptual rather than intervention-based; focused on expert consensus.
7. Charron, et al. [27]
 - o Focus: Systematic review of physical activity (including Tai Chi) and disability outcomes in MS.
 - o Results: Tai Chi was associated with reduced disability progression and improved physical function.
 - o Techniques: Reviewed studies using various Tai Chi forms; no single style specified.
 - o Disclosure: Aggregated data, no detailed protocol provided.
8. Lan, et al. [28]
 - o Focus: Tai Chi Chuan in medicine and health promotion, including MS.
 - o Results: Highlighted Tai Chi’s benefits for balance, muscle strength, and psychological well-being, with relevance to MS.
 - o Techniques: General Tai Chi Chuan, often Yang style in cited studies, but not MS-specific.
 - o Disclosure: Broad review, lacking MS-specific intervention details.

9. Menkyova, et al. [2]
 - o Focus: One-year prospective study of Tai Chi on balance, mood, cognition, and quality of life in women with MS.
 - o Results: Significant improvements in balance (Timed Up and Go test), mood, cognition, and quality of life after 12 months.
 - o Techniques: Used a modified Tai Chi program (unspecified style) with 60-minute sessions twice weekly.
 - o Disclosure: Adapted for MS but lacked specific form details.
10. Shi, et al. [3]
 - o Focus: Systematic review and meta-analysis of traditional Chinese exercises (including Tai Chi and Qigong) in MS.
 - o Results: Found significant benefits in physical function, fatigue, and psychological health.
 - o Techniques: Included various Tai Chi styles (e.g., Yang) and Qigong forms (e.g., Baduanjin); specifics varied by study.
 - o Disclosure: Aggregated data; some studies specified Yang-style Tai Chi or Baduanjin Qigong.
11. Taylor & Taylor-Piliae [29]
 - o Focus: Systematic review of Tai Chi effects on physical and psychosocial function in MS.
 - o Results: Improved balance, strength, and mood; reduced fatigue and depression.
 - o Techniques: Primarily Yang-style Tai Chi across reviewed studies, adapted for MS.
 - o Disclosure: Yang style commonly noted, with slow, flowing movements emphasized.
12. Wahbeh, et al. [30]
 - o Focus: Mind-body interventions (including Tai Chi) in neurology, including MS.
 - o Results: Tai Chi showed promise for balance and fatigue management in neurological conditions like MS.
 - o Techniques: General Tai Chi, no specific style detailed.
 - o Disclosure: Broad review, not MS-specific in intervention details.
13. Wang, et al. [31]
 - o Focus: Tai Chi Quan benefits in neurodegenerative diseases, including MS.
 - o Results: Improved balance, motor function, and quality of life; reduced fatigue.
 - o Techniques: Mostly Yang-style Tai Chi in cited studies.
 - o Disclosure: General Tai Chi, with some style specification in reviewed studies.
14. Xiang, et al. [32]
 - o Focus: Meta-analysis of Tai Chi for fatigue relief, including MS studies.
 - o Results: Tai Chi significantly reduced fatigue across populations, including MS patients.
 - o Techniques: Various Tai Chi styles, often Yang, but not MS-specific.
 - o Disclosure: Aggregated data; style specifics not emphasized.
15. Zhang, et al. [33]
 - o Focus: Systematic review of exercise (including Tai Chi) for neuropathic pain, relevant to MS.
 - o Results: Tai Chi reduced pain and improved function in neuropathic conditions.
 - o Techniques: General Tai Chi, no specific style detailed.
 - o Disclosure: Broad review, not MS-exclusive.
16. Zou, et al. [4]
 - o Focus: Systematic review of Tai Chi for health benefits in MS.
 - o Results: Improved balance, fatigue, and quality of life; safe and feasible for MS patients.
 - o Techniques: Primarily Yang-style Tai Chi, adapted for MS mobility limitations.
 - o Disclosure: Yang style frequently cited, with slow movements emphasized.

Overall Discussion

The studies collectively demonstrate that Tai Chi and Qigong offer significant benefits for individuals with MS, particularly in improving balance, fatigue, mood, quality of life, and physical function. Systematic reviews and meta-analyses (e.g., Shi, et al. [3,4,29]) reinforce these findings with statistical rigor, while primary studies (e.g., Burschka, et al. [1,2]) provide detailed evidence of efficacy in specific domains like coordination and depression. Qualitative data from Buttolph, et al. [6] further highlight the social and emotional benefits, enhancing the holistic impact of these practices. The Yang style of Tai Chi emerges as the most commonly specified technique, valued for its slow, flowing movements that suit MS patients' mobility constraints. Qigong interventions, while less standardized, focus on gentle movements, breathing, and mindfulness, often tailored to community settings (Buttolph, et al. [5,6]). However, many studies lack precise descriptions of forms or sequences (e.g., 24-form Tai Chi or Baduanjin Qigong), limiting replication specificity. Limitations include small sample sizes in some primary studies, variability in intervention duration (ranging from 8 weeks to 1 year), and inconsistent reporting of techniques. Nonetheless, the consistency of positive outcomes across physical and psychosocial domains suggests Tai Chi and Qigong are valuable complementary therapies for MS management.

Key Takeaways

- Benefits: Improved balance, reduced fatigue, enhanced mood, better quality of life, and feasible implementation.
- Techniques: Yang-style Tai Chi is most frequently cited; Qigong focuses on breathing and gentle movements, often unspecified in style.
- Gaps: More detailed reporting of specific forms and larger, longer-term studies are needed for stronger evidence.

This summary reflects the current state of research as of March 13, 2025, based on the provided studies.

Concluding Comments

Prior studies have found that Yang style tai chi was the most frequently used style for treatment of a wide variety of ailments, and that the Yang 24 form was the most frequently used tai chi set [42-43]. Studies have found that baduanjin was the most frequently used qigong set used to treat a wide range of ailments [44]. The author wanted to learn which tai chi and qigong sets were used to treat MS patients, but the Grok3 search did not uncover much information on this point. Perhaps a detailed reading of the studies by a human being would be able to uncover additional relevant information on this point. Some tai chi and qigong practitioners take the position that the tai chi or qigong form chosen does not make much difference, since they all strengthen the body's natural immune system, while others believe that some tai chi and qigong exercise sets are better than others for specific ailments. One way to determine which tai chi or qigong sets were used in a particular study would be to contact the individuals who conducted the study. The current study was successful, in the sense that it was able to determine how skillful Grok3 was in summarizing studies once the relevant studies had been found. This study can be replicated in several ways. For one, a different AI assistant could be used, with the results being compared to those of the present study. Another replication would be to attempt to summarize another set of studies to see whether the quality of the summaries is acceptable. It might be mentioned that using AI to summarize prior studies is not the final step in medical research.

It is only an intermediate step. After reading the summaries, the researcher must identify which of the summarized studies deserve further attention. Thus, it will be necessary at some point to read some studies in their entirety. Creating summaries only simplifies the research process and can be a time-saving device. It does not take the place of rigorous medical research.

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Robert W McGee. *Biomed J Sci & Tech Res*

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