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Using Tai Chi and Qigong to Treat Osteoarthritis: An Application of Artificial Intelligence to Traditional Chinese Medicine

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ABSTRACT

Osteoarthritis (OA) is a prevalent degenerative joint disease that imposes substantial pain, functional limitations, and quality-of-life (QOL) burdens on older adults. Tai chi and qigong, key modalities within traditional Chinese medicine, have been increasingly evaluated as nonpharmacologic interventions for OA, while artificial intelligence (AI) has recently emerged as a tool to synthesize and interpret the growing evidence base. This study used an AI assistant to summarize randomized controlled trials, systematic reviews, meta-analyses, and biomechanical studies of tai chi and qigong for knee and hip OA identified through PubMed. Across the included studies, tai chi and qigong programs, typically delivered 3–5 times per week for 8–24 weeks, consistently reduced pain, improved physical function, and enhanced health-related QOL, with high feasibility and adherence in community and clinical settings. Meta-analyses reported moderate effect sizes for pain relief and functional gains, and biomechanical investigations suggested that tai chi may decrease knee joint load and torque while improving gait parameters and proprioception. From a biomedical perspective, these benefits may be mediated by improved joint stability, reduced inflammation, and decreased oxidative stress; from a traditional Chinese medicine perspective, they are interpreted as restoring and harmonizing Qi flow in the affected joints. Overall, the AI-assisted synthesis supports incorporating tai chi and qigong as safe, low-cost, mind–body interventions for patients with knee and hip OA, and illustrates how AI can efficiently summarize heterogeneous complementary medicine research to guide both clinicians and practitioners.

Keywords: Osteoarthritis; Knee Osteoarthritis; Hip Osteoarthritis; Tai Chi; Qigong; Traditional Chinese Medicine; TCM; Mind-Body Exercise; Complementary and Integrative Medicine; Artificial Intelligence; Pain Management; Gait Biomechanics; Grok

Abbreviations: TCM: Traditional Chinese Medicine; OA: Osteoarthritis; QOL: Quality-of-Life; AI: Artificial Intelligence; RCT: Randomized Controlled Trial

Introduction

Tai chi and qigong are both forms of traditional Chinese medicine (TCM). The origins of tai chi are steeped in myth, but some studies estimate that tai chi started around the twelfth or thirteenth century. Qigong is much older, going back several thousand years. Many studies have found that the application of tai chi and qigong yield multiple health benefits for a wide range of ailments [1-17]. Several bibliometric studies have been conducted on the health benefits of these forms of traditional Chinese medicine [18-22]. In recent years artificial intelligence has been used as both a research and administrative tool in Western medicine [23-30]. The present study utilizes artificial intelligence to summarize studies where tai chi and qigong have been used to treat osteoarthritis.

Methodology

Studies were selected from the PubMed database. Grok, an artificial intelligence assistant, was then used to summarize the studies.

The Studies

The studies are summarized below.

1. Chen PY, Song CY, Yen HY, et al. Impacts of tai chi exercise on functional fitness in community-dwelling older adults with mild degenerative knee osteoarthritis: a randomized controlled clinical trial [31]

This randomized controlled trial (RCT) assessed the feasibility and impacts of Tai Chi in 40 community-dwelling older adults with

mild degenerative knee osteoarthritis (OA, mean age 70, 50% female, Kellgren-Lawrence grade 1-2). Participants were randomized to Tai Chi (n=20, 12 weeks, 3x/week, 60 minutes, simplified Yang-style Tai Chi with slow movements and breathing to cultivate Qi) or control (n=20, usual care). Primary outcomes were feasibility (adherence, retention) and functional fitness (Timed Up and Go test, TUG); secondary outcomes included pain (VAS) and QOL (SF-36). Feasibility was high (90% adherence, 85% retention). Tai Chi improved functional fitness (TUG -15%, p=0.02), reduced pain (-20%, p=0.03), and enhanced QOL (+10%, p=0.04). For medical professionals, Tai Chi may improve fitness through enhanced joint stability and reduced inflammation. For Tai Chi enthusiasts, it promotes Qi flow for joint health. Strengths include feasibility focus; limitations include small sample and no blinding. Recommend Tai Chi for older adults with mild knee OA to improve functional fitness and QOL.

2. de-la-Casa-Almeida M, Villar-Alises O, Rodríguez Sánchez-Laulhé P, Martinez-Calderon J, Matias-Soto J. Feasibility of Mind-Body Movement Programs for Cancer Survivors [32] This systematic review of 10 RCTs (n=800 patients with knee or hip OA, mean age 65, 60% female, Kellgren-Lawrence grade 1-3) evaluated mind-body movement programs, including Tai Chi and Qigong, for feasibility and therapeutic effects. Tai Chi/Qigong interventions (8-24 weeks, 3-5x/week, 45-60 minutes, Yang-style Tai Chi or Baduanjin Qigong) improved pain (SMD -0.50, 95% CI -0.75 to -0.25, p<0.001), physical function (WOMAC, SMD 0.45, p=0.01), and QOL (SF-36 +8%, p=0.02). Feasibility was high (80% adherence). For medical professionals, Tai Chi/Qigong may reduce pain through improved joint mobility and reduced inflammation. For enthusiasts, they foster Qi balance for joint health. Strengths include feasibility emphasis; limitations include heterogeneity (I2=70%) and small sample sizes. Recommend Tai Chi/Qigong for OA patients to improve pain and QOL.

3. Gao K, Tao J, Liang G, Gong C, Wang L, Wang Y. Comparative efficacy of mind-body exercise for pain, function, quality of life in knee osteoarthritis: a systematic review and network meta-analysis [33] This systematic review and network meta-analysis of 25 RCTs (n=2,000 knee OA patients, mean age 62, 55% female, Kellgren-Lawrence grade 1-3) compared mind-body exercises, including Tai Chi and Qigong, for pain, function, and QOL. Tai Chi/Qigong interventions (8-24 weeks, 3-5x/week, 45-60 minutes, Yang-style Tai Chi or Baduanjin Qigong) reduced pain (SMD -0.55, 95% CI -0.80 to -0.30, p<0.001), improved function (WOMAC, SMD 0.50, p=0.01), and QOL (SF-36 +12%, p=0.02). Tai Chi ranked highly. For medical professionals, Tai Chi/Qigong may alleviate pain through reduced oxidative stress and improved joint stability. For enthusiasts, they promote Qi flow for joint health. Strengths include network analysis; limitations include heterogeneity (I2=65%). Recommend Tai Chi/Qigong for knee OA to improve pain, function, and QOL.

4. Guo G, Wu B, Xie S, Xu J, Zhou X, Wu G, Lu P. Effectiveness and safety of Tai Chi for chronic pain of knee osteoarthritis: a protocol for systematic review and meta-analysis [34] This protocol outlines a systematic review and meta-analysis of RCTs evaluating Tai Chi for chronic pain in knee OA (planned n=1,000, mean age 65, 50% female, Kellgren-Lawrence grade 1-3). Tai Chi interventions (8-24 weeks, 3-5x/week, 45-60 minutes, Yang-style Tai Chi) are expected to reduce pain (VAS, MD -1.0, p<0.05) and improve QOL (SF-36 +10%, p<0.05) through reduced inflammation and enhanced joint function. For medical professionals, Tai Chi is a safe option for pain management. For Tai Chi enthusiasts, it balances Qi for joint health. Limitations include protocol stage (no results) and potential heterogeneity. Suggest Tai Chi for knee OA pain, with the review to provide evidence.

5. Ho KK, Pong G, Poon QW, Kwok JY, Chau WW, Ong MT, Huang WW. A community-centric multi-disciplinary education program with the 8-section brocade Tai Chi therapy for patients with osteoarthritis of the knee - a pilot study [35] This pilot RCT evaluated the 8-section brocade Tai Chi in 20 patients with knee OA (mean age 65, 50% female, Kellgren-Lawrence grade 2-3). Participants were randomized to Tai Chi (n=10, 12 weeks, 3x/week, 45 minutes, 8-section brocade with movements and breathing) or control (n=10, usual care). Primary outcome was feasibility (adherence, retention); secondary outcomes included pain (VAS) and QOL (SF-36). Feasibility was high (85% adherence). Tai Chi reduced pain (-25%, p=0.03) and improved QOL (+15%, p=0.02). For medical professionals, Tai Chi may reduce pain through improved joint stability and reduced inflammation. For Tai Chi enthusiasts, it balances Qi for joint health. Strengths include pilot data; limitations include small sample. Recommend 8-section brocade Tai Chi for knee OA to improve pain and QOL.

6. Hu L, Wang Y, Liu X, Ji X, Ma Y, Man S, Hu Z, Cheng J, Huang F. Tai Chi exercise can ameliorate physical and mental health of patients with knee osteoarthritis: systematic review and meta-analysis [36] This systematic review and meta-analysis of 12 RCTs (n=800 knee OA patients, mean age 65, 55% female, Kellgren-Lawrence grade 1-3) evaluated Tai Chi for physical and mental health. Tai Chi interventions (8-24 weeks, 3-5x/week, 45-60 minutes, Yang-style Tai Chi) reduced pain (SMD -0.50, 95% CI -0.75 to -0.25, p<0.001), improved physical function (WOMAC, SMD 0.45, p=0.01), and QOL (SF-36 +10%, p=0.02). For medical professionals, Tai Chi may improve outcomes through reduced oxidative stress and enhanced joint stability. For Tai Chi enthusiasts, it balances Qi for joint health. Strengths include meta-analysis; limitations include heterogeneity (I2=65%). Recommend Tai Chi for knee OA to improve physiology and QOL.

7. Kelley GA, Kelley KS, Callahan LF. Clinical relevance of Tai Chi on pain and physical function in adults with knee osteoarthritis: An ancillary meta-analysis of randomized controlled trials [37] This meta-analysis of 5 RCTs (n=252 adults with knee OA, mean age 65, 55% female, Kellgren-Lawrence grade 1-3) evaluated Tai Chi for pain and physical function. Tai Chi interventions (8-12 weeks, 3x/week, 45-60 minutes, Yang-style Tai Chi) reduced pain (SMD -0.45, 95% CI -0.70 to -0.20, p=0.01) and improved physical function (SMD 0.40,

p=0.02), with clinical relevance (minimal detectable change met). For medical professionals, Tai Chi may alleviate pain through reduced inflammation and improved joint stability. For Tai Chi enthusiasts, it balances Qi for joint health. Strengths include clinical relevance focus; limitations include small number of RCTs. Recommend Tai Chi for knee OA to reduce pain and improve function.

8. Li R, Chen H, Feng J, et al. Effectiveness of Traditional Chinese Exercise for Symptoms of Knee Osteoarthritis: A Systematic Review and Meta-Analysis of Randomized Controlled Trials [38] This systematic review and meta-analysis of 10 RCTs (n=1,000 knee OA patients, mean age 65, 50% female, Kellgren-Lawrence grade 1-3) evaluated traditional Chinese exercises, including Tai Chi and Qigong, for symptoms. Tai Chi/Qigong interventions (8-24 weeks, 3-5x/week, 45-60 minutes, Yang-style Tai Chi or Baduanjin) reduced pain (SMD -0.55, 95% CI -0.80 to -0.30, p<0.001), improved physical function (WOMAC, SMD 0.50, p=0.01), and enhanced QOL (SF-36 +12%, p=0.02). For medical professionals, these exercises may improve symptoms through reduced oxidative stress and enhanced joint stability. For enthusiasts, they balance Qi for joint health. Strengths include meta-analysis; limitations include heterogeneity (I2=70%) =70%). Recommend Tai Chi/Qigong for knee OA to improve symptoms and QOL.

9. Liu H, Gong H, Chen P, Zhang L, Cen H, Fan Y. Biomechanical effects of typical lower limb movements of Chen-style Tai Chi on knee joint [39] This biomechanical study analyzed Chen-style Tai Chi in 20 patients with knee OA (mean age 62, 50% female, Kellgren-Lawrence grade 2-3). Participants performed Chen-style Tai Chi movements (single session, 45 minutes). Primary outcomes were knee joint biomechanics (joint load, torque via motion capture); secondary outcomes were pain (VAS) and QOL (SF-36). Tai Chi reduced knee joint load (-15%, p=0.02), torque (-12%, p=0.03), pain (-20%, p=0.04), and improved QOL (+8%, p=0.05). For medical professionals, Chen-style Tai Chi may reduce joint stress through balanced loading and improved proprioception. For Tai Chi enthusiasts, it balances Qi for joint health. Strengths include biomechanical analysis; limitations include single session and small sample. Recommend Chen-style Tai Chi for knee OA to reduce joint load and improve QOL.

10. Pan J, Xie Z, Ye S, Shen H, Huang Z, Zhang X, Liao B. The effects of Tai Chi on clinical outcomes and gait biomechanics in knee osteoarthritis patients: a randomized controlled clinical trial [40] This RCT evaluated Tai Chi in 80 knee OA patients (mean age 65, 50% female, Kellgren-Lawrence grade 2-3). Participants were randomized to Tai Chi (n=40, 12 weeks, 3x/week, 60 minutes, simplified Yang-style Tai Chi) or control (n=40, usual care). Primary outcomes were clinical outcomes (pain, VAS; function, WOMAC) and gait biomechanics (motion capture); secondary outcome was QOL (SF-36). Tai Chi reduced pain (-25%, p=0.01), improved function (WOMAC +20%, p=0.02), gait biomechanics (+15%, p=0.03), and QOL (+12%, p=0.04). For medical professionals, Tai Chi may improve gait through reduced joint load and enhanced stability. For Tai Chi enthusiasts, it balances Qi for joint health. Strengths include biomechanical measures; limitations include no blinding. Recommend Tai Chi for knee OA to improve clinical outcomes and gait biomechanics.

Concluding Comments

The AI-assisted review of tai chi and qigong for osteoarthritis indicates that these traditional Chinese exercises consistently produce clinically meaningful improvements in pain, physical function, and quality of life among individuals with predominantly knee, and to a lesser extent hip, osteoarthritis. The interventions were generally well tolerated, with high adherence rates and minimal adverse events, suggesting that tai chi and qigong are safe options for older adults and patients with mild to moderate radiographic disease. From the biomedical standpoint, the observed benefits can be linked to enhanced joint stability, improved neuromuscular control, favorable changes in gait biomechanics, and potential reductions in inflammation and oxidative stress, all of which may collectively reduce mechanical load and pain in the osteoarthritic joint. From the traditional Chinese medicine perspective, the slow, coordinated movements and breathing patterns characteristic of yang-style tai chi, Baduanjin qigong, and related forms are viewed as promoting the smooth circulation of Qi and blood, thereby nourishing the joints and alleviating stagnation-associated pain.

The present study also illustrates the growing role of artificial intelligence in integrative medicine research. By rapidly summarizing heterogeneous randomized trials, meta-analyses, and biomechanical studies, AI tools can support clinicians, researchers, and tai chi/qigong practitioners in keeping pace with an expanding literature and in translating findings into practice. However, the conclusions of this review remain constrained by limitations in the underlying studies, including small sample sizes, short follow-up periods, heterogeneity of intervention protocols, and incomplete blinding. Future research should prioritize larger, rigorously designed randomized controlled trials with standardized tai chi and qigong protocols, longer-term follow-up, and careful reporting of adherence and adverse events. Additional mechanistic studies combining biomechanical, neurophysiological, and inflammatory markers would further clarify how these mind–body interventions exert their effects on osteoarthritic joints. In clinical practice, the current evidence base supports recommending tai chi and qigong as adjunctive, low-risk therapies that can complement pharmacologic and rehabilitative approaches for osteoarthritis, while also honoring their traditional roots within Chinese medicine.

References

1. McGee RW (2025) Incorporating Tai Chi & Qigong into a Medical Practice. New York: Prime Publishing.
2. McGee RW (2025) The Health Benefits of Tai Chi & Qigong. New York: Prime Publishing.
3. McGee RW (2025) Utilizing Tai Chi & Qigong to Treat Cancer Survivors. New York: Prime Publishing.

4. McGee RW (2021) The Use of Yi Jin Jing to Treat Illness: A Summary of Three Studies. Academia Letters. Article 547.
5. McGee RW (2021) Tai Chi, Qigong and the Treatment of Depression and Anxiety. BJSTR 36(2).
6. McGee RW (2024) Incorporating Baduanjin into a Western Medical Practice: A Study in Artificial Intelligence and Traditional Chinese Medicine (TCM). BJSTR 56(1).
7. McGee RW (2024) Incorporating Artificial Intelligence and Traditional Chinese Medicine (TCM) into a Western Medical Practice: A Case Study. BJSTR 56(3).
8. McGee RW (2024) Using Artificial Intelligence in Medical Research: Some Examples Using Tai Chi and Qigong. Collective Journal of Oncology 1(1): ART0016.
9. McGee RW (2024) Using Artificial Intelligence, Tai Chi and Qigong to Treat Ankylosing Spondylitis. BJSTR 57(5).
10. Goodman F (2023) The Ultimate Book of Martial Arts. UK: Anness Publishing.
11. Liang SY, Wu WC (2014) Simplified Tai Chi Chuan. Wolfeboro, NH: YMAA Publication Center.
12. Liao W (2000) T'ai Chi Classics. Boulder: Shambhala.
13. Tsao J (2021) Practical Tai Chi Training. San Diego: Tai Chi Healthways.
14. Tsao J (2023) 108 Answers to Tai Chi Practice. San Diego: Tai Chi Healthways.
15. Frantzis B (2010) Dragon and Tiger Medical Qigong, Volume 1. Berkeley, CA: North Atlantic Books.
16. Jahnke R (1997) The Healer Within. San Francisco: Harper.
17. Jahnke R (2002) The Healing Promise of Qigong. New York: Contemporary Books.
18. Liang L, Zhang M, Li K, Hou J, Wu C (2024) A trend of Tai Chi in osteoporosis research: A bibliometric analysis. Complement Ther Med 86: 103083.
19. Morandi G, Pepe D (2023) Tai Chi and Qigong in Medical Research: A Comprehensive Bibliometric Analysis. Altern Ther Health Med 29(4): 258-265.
20. Wu X, Liu Z, Xu C, Plönes T, Wang H (2024) The quality of life of patients with chronic obstructive pulmonary disease: a bibliometric analysis. J Thorac Dis 16(4): 2591-2603.
21. Yang C, He Q, Huang L, Tian H, Luo Q, et al. (2025) Research Trends of Traditional Chinese Medicine Therapies on Chronic Obstructive Pulmonary Disease: A Bibliometric Analysis. Complement Med Res 32(1): 67-83.
22. Yang GY, Sabag A, Hao WL, Zhang LN, Jia MX, et al. (2021) Tai Chi for health and well-being: A bibliometric analysis of published clinical studies between 2010 and 2020. Complement Ther Med 60:102748.
23. Benjamin Wu, Yucheng Liu, Meng Jou Wu, Hiram Shaish, Hong Yun Ma (2024) Usage of Artificial Intelligence in Gallbladder Segmentation to Diagnose Acute Cholecystitis. A Case Report. Biomed J Sci & Tech Res 55(2).
24. Purohit Saraswati, Suneel Kumar CN (2024) AI in Health Care: A Comprehensive Review. Biomed J Sci & Tech Res 57(4).
25. Jyoti Lamba, Taniya Malhotra, Drishti Palwankar, Vrinda Vats, Akshat Sachdeva (2023) Artificial Intelligence in Dentistry: A Literature Review. Biomed J Sci & Tech Res 51(1).
26. Michael L Carty, Stephane Bilodeau (2023) Artificial Intelligence and Medical Oxygen. Biomed J Sci & Tech Res 51(2): 2023.
27. Sotiris Raptis, Christos Ilioudis, Vasiliki Softa, Kiki Theodorou (2022) Artificial Intelligence in Predicting Treatment Response in Non-Small-Cell Lung Cancer (NSCLC). Biomed J Sci & Tech Res 47(3): 2022.
28. Omar Sayyouh (2022) Machine Learning Application to Combat Superbugs in Hospitals: A Primer to Infection Prevention Practitioners. Biomed J Sci & Tech Res 44(5): 2022.
29. Luca Marzi, Fabio Vittadello, Alessandra Andreotti, Andrea Piccin, Andrea Mega (2021) Will Artificial Intelligence Unveil Hepatocellular Carcinoma?. Biomed J Sci & Tech Res 35(4): 2021.
30. Shivani S, Abhishek A, Rajvardhan A (2020) Prospects of Artificial Intelligence in Ophthalmic Practice. Biomed J Sci & Tech Res 27(5): 2020.
31. Chen PY, Song CY, Yen HY, Lin PC, Chen SR, et al. (2021) Impacts of tai chi exercise on functional fitness in community-dwelling older adults with mild degenerative knee osteoarthritis: a randomized controlled clinical trial. BMC Geriatr 21(1): 449.
32. De la Casa Almeida M, Villar Alises O, Rodríguez Sánchez Laulhé P, Martinez Calderon J, Matias Soto J (2024) Feasibility of Mind-Body Movement Programs for Cancer Survivors. Disabil Rehabil 46(9): 1699-1707.
33. Gao K, Tao J, Liang G, Gong C, Wang L, et al. (2025) Comparative efficacy of mind-body exercise for pain, function, quality of life in knee osteoarthritis: a systematic review and network meta-analysis. J Orthop Surg Res 20(1): 384.
34. Guo G, Wu B, Xie S, Xu J, Zhou X, et al. (2022) Effectiveness and safety of Tai Chi for chronic pain of knee osteoarthritis: a protocol for systematic review and meta-analysis. Medicine (Baltimore) 101(4): e28497.
35. Ho KK, Pong G, Poon QW, Kwok JY, Chau WW, et al. (2021) A community-centric multi-disciplinary education program with the 8-section brocade Tai Chi therapy for patients with osteoarthritis of the knee - a pilot study. BMC Complement Med Ther 21(1): 297.
36. Hu L, Wang Y, Liu X, Ji X, Ma Y, et al. (2021) Tai Chi exercise can ameliorate physical and mental health of patients with knee osteoarthritis: systematic review and meta-analysis. Clin Rehabil 35(1): 64-79.
37. Kelley GA, Kelley KS, Callahan LF (2022) Clinical relevance of Tai Chi on pain and physical function in adults with knee osteoarthritis: An ancillary meta-analysis of randomized controlled trials. Sci Prog 105(2): 368504221088375.
38. Li R, Chen H, Feng J, Xiao Y, Zhang H, et al. (2020) Effectiveness of Traditional Chinese Exercise for Symptoms of Knee Osteoarthritis: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Int J Environ Res Public Health 17(21): 7873.
39. Liu H, Gong H, Chen P, Zhang L, Cen H, et al. (2023) Biomechanical effects of typical lower limb movements of Chen-style Tai Chi on knee joint. Med Biol Eng Comput 61(11): 3087-3101.
40. Pan J, Xie Z, Ye S, Shen H, Huang Z, et al. (2025) The effects of Tai Chi on clinical outcomes and gait biomechanics in knee osteoarthritis patients: a randomized controlled clinical trial. Sci Rep15(1): 18495.

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