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Review Article



# Using Tai Chi and Qigong to Treat Insomnia and Sleep Disorders: An Application of Artificial Intelligence to Traditional Chinese Medicine

**Robert W McGee***

*Fayetteville State University, USA*

***Corresponding author:** Robert W McGee, Fayetteville State University, USA.

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## Abstract

**Background:** Insomnia and sleep disturbance are common in older adults, cancer survivors, and patients with chronic medical conditions, and many individuals seek non-pharmacological strategies to manage these problems. Tai chi and qigong—traditional Chinese mind–body practices—have been increasingly incorporated into clinica research as potential interventions for improving sleep.

**Objective:** This article uses artificial intelligence to assist in identifying, organizing, and summarizing clinical studies and protocols that evaluate tai chi and qigong for insomnia and sleep disorders.

**Methods:** Studies were located through the PubMed database, and an AI assistant (Grok) was employed to help extract and structure information from randomized controlled trials, trial protocols, systematic reviews, and narrative overviews that included tai chi and/or qigong with sleep-related outcomes. Key elements captured included study design, participant characteristics, intervention format, sleep measures, principal findings, proposed mechanisms, and noted strengths and limitations.

**Results:** The assembled literature indicates that tai chi and qigong are frequently associated with improvements in self-reported sleep quality, insomnia severity, and related symptoms across a range of populations, including community-dwelling older adults and cancer survivors. Some trials suggest that tai chi is non-inferior to CBT-I for long-term insomnia outcomes, while others demonstrate benefits when tai chi is combined with modalities such as mindfulness training or repetitive transcranial magnetic stimulation. Objective sleep changes are less consistently observed, and reporting of protocol details and mechanistic measures (e.g., inflammatory markers, autonomic balance) varies across studies.

**Conclusions:** Current evidence supports tai chi and qigong as feasible, low-risk, and potentially effective non-pharmacological options for individuals with insomnia and sleep disturbance, particularly when incorporated into broader integrative care plans. However, methodological heterogeneity, limited objective sleep assessment, and incomplete reporting underscore the need for more rigorous and standardized trials. The AI-assisted approach illustrated here offers a practical framework for keeping pace with the evolving insomnia literature on tai chi and qigong and may be adaptable to other areas of traditional Chinese medicine research.

**Keywords:** Tai Chi, Qigong, Insomnia, Sleep Disorders, Randomized Controlled Trial, Meta-Analysis, Cancer-Related Insomnia, Older Adults, Mind-Body Intervention, Non-Pharmacological Treatment

## 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 insomnia.

Insomnia and related sleep complaints are rarely isolated phenomena; they often co-occur with chronic medical conditions, cancer survivorship, aging, and psychological distress, creating a complex clinical picture that is not always well served by a purely pharmacological strategy. Many patients cycle through sedative-hypnotic medications, over-the-counter remedies, and informal "sleep hygiene" advice without achieving sustained relief. In this context, clinicians and researchers have become increasingly interested in structured behavioral and mind-body interventions that can be integrated into long-term self-care and rehabilitation programs. Tai chi and qigong, which combine slow movement, breath regulation, and focused attention, occupy a unique position at the intersection of exercise, meditation, and traditional Chinese medicine.

The sleep literature on tai chi and qigong spans a wide methodological spectrum-ranging from trial protocols and small pilot studies to large randomized controlled trials and systematic reviews. Some investigations compare tai chi directly with cognitive behavioral therapy for insomnia (CBT-I), others examine tai chi as one component of a broader lifestyle or integrative oncology program, and still others treat it as a form of exercise therapy alongside walking and resistance training. A number of recent publications have introduced innovative designs, such as combining tai chi with repetitive transcranial magnetic stimulation, or embedding tai chi within mindfulness-based interventions for community-dwelling older adults, reflecting a trend toward multimodal approaches to sleep disturbance. At the same time, bibliometric work on non-drug treatments for insomnia has identified tai chi and qigong as emerging research frontiers, particularly in the post-2021 period. Despite this growing activity, there remains a need for focused, clinically oriented synthesis that highlights how tai chi and qigong are actually being used in insomnia research and practice. Existing reviews often treat these interventions as one item in a long list of complementary therapies, providing only brief commentary on study design, sample characteristics, and sleep outcomes. In addition, many clinicians are unfamiliar with the practical features of tai chi and qigong protocols used in trials-session length, program duration, home practice expectations, and instructor qualifications-which can impede translation into routine care. A concise mapping of the insomnia-related evidence, oriented toward these concrete details, can therefore help both medical professionals and tai chi/qigong instructors make more informed decisions about program design and patient referral.

The present study addresses this gap by using artificial intelligence to organize and summarize the insomnia and sleep-disorder literature on tai chi and qigong in a structured, user-friendly format. Rather than attempting a formal meta-analysis, the goal is to provide an overview of key protocols, target populations, reported benefits and limitations, and hypothesized mechanisms, drawing on both completed trials and published protocols. In doing so, this article also illustrates how AI tools can support rapid, iterative evidence synthesis in traditional Chinese medicine, complementing conventional narrative and systematic review methods.

## Methodology

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

## Study Summaries

### *Chan SH, et al.,* (2022) [31]

**Study design**: Protocol for a four-armed randomized controlled trial with repeated measures, including quantitative and qualitative components, to evaluate an integrated mindfulness-based Tai Chi Chuan (MBTCC) programme versus mindfulness-based intervention alone, Tai Chi Chuan alone, and sleep hygiene education control, with follow-ups at 8 weeks, 6 months, and 12 months.

**Participant details:** Planned recruitment of 256 community-dwelling older adults aged ≥60 years with sleep problems (Pittsburgh Sleep Quality Index >5), able to communicate in Cantonese, primary education or above, no prior experience with meditation or mind-body techniques; exclusions include schizophrenia, substance misuse, organic brain syndrome, or intellectual disabilities; sex not specified.

**Intervention protocols:** Tai Chi Chuan group involves eight weekly sessions of 2-2.5 hours each, using nine-form Yang-style Tai Chi, focusing on sequential movements, post-standing, walking, and twisting with emphasis on accuracy, relaxation ("song"), and tranquility; daily home practice encouraged with audio/video support.

**Key findings with statistical data:** Protocol; no findings or statistical data available yet.

**Potential mechanisms for medical professionals:** Tai Chi may reduce arousal through focused attention on posture and movement, attenuating responsiveness via relaxation principles, and promoting tranquility to settle unease, potentially influencing autonomic nervous system balance and physical health function.

Benefits for Tai Chi/Qigong enthusiasts: Practitioners can cultivate Qi through mindful movements and breathing, fostering inner harmony and energy flow, which may enhance sleep by balancing yin-yang and reducing mental clutter.

**Strengths:** Large sample size for detecting small effects, longitudinal design with extended follow-up, randomization to mini-

mize bias, intention-to-treat analysis, and qualitative interviews for deeper insights.

**Limitations:** Potential attrition and selection bias, long follow-up risking retention issues, limited generalizability to non-Chinese or experienced practitioners.

**Clinical recommendations:** Pending results, Tai Chi could serve as a cost-effective, low-risk alternative for sleep disturbances in older adults; healthcare providers may consider it for community-based interventions if efficacy is confirmed.

### *Chen Q, et al.,* (2024) [32]

**Study design**: Protocol for a systematic review and network meta-analysis of randomized controlled trials on non-pharmacological interventions for cancer-related insomnia, following PRISMA guidelines.

**Participant details**: Planned inclusion of adults (≥18 years) with pathologically confirmed malignant tumors (any type/stage), insomnia per ICSD-3/DSM-5 criteria, PSQI >7 or ISI ≥8, survival >3 months; no sex restrictions; exclusions for language/communication disorders.

**Intervention protocols:** Tai Chi and Qigong classified under exercise therapy; no specific duration, frequency, or type detailed, as to be extracted from included trials.

**Key findings with statistical data:** Protocol; no findings or statistical data available.

**Potential mechanisms for medical professionals:** General for cancer-related insomnia: cytokine dysregulation (IL-1β, TNF-α, IL-6), HPA axis disruption, cortisol rhythm alterations; Tai Chi/Qigong may modulate inflammation and anxiety via physiological (reduced arousal) and psychological (stress reduction) pathways.

**Benefits for Tai Chi/Qigong enthusiasts:** These practices enhance Qi circulation and mind-body integration, potentially alleviating insomnia by restoring energy balance and promoting serene awareness.

**Strengths:** Focus on RCTs for high-quality evidence, use of Cochrane ROB 2.0 and GRADE, broad intervention range for generalizability.

**Limitations:** Limited to Chinese/English literature (language bias), potential heterogeneity from cancer variations, data inconsistency challenges.

**Clinical recommendations:** Await results to rank Tai Chi/Qigong efficacy; may guide non-pharmacological choices for cancer-related insomnia if superior.

### *D'Aurea CVR, et al.,* (2022) [33]

**Study design:** Systematic review and meta-analysis of randomized and quasi-randomized controlled trials on physical exercise for adults with insomnia, following PRISMA and Cochrane guidelines.

**Participant details:** 295 participants across 6 studies, aged 30-85 years, both sexes, with DSM-IV/ICSD-2 diagnosed insomnia; included sedentary adults, older adults, postmenopausal women; exclusions for mood/psychiatric disorders.

**Intervention protocols:** Tai Chi in one study (*Irwin, et al.,* 2014): 2 hours, twice weekly for 4 months; type not specified.

**Key findings with statistical data:** Tai Chi showed no significant objective improvements (TST SMD -0.09, 95% CI -0.45 to 0.28; SOL MD 0.8, 95% CI -6.13 to 7.73; SE MD -0.9, 95% CI -4.52 to 2.73; WASO MD 0.79, 95% CI -13.95 to 15.52; low quality); significant subjective improvements (insomnia severity SMD -0.72, 95% CI -1.10 to -0.34, $p<0.05$, high quality; PSQI MD -3.17, 95% CI -4.23 to -2.12, very low quality).

**Potential mechanisms for medical professionals:** Physiological: elevated body temperature promoting drowsiness, increased melatonin, reduced inflammation, enhanced metabolic/endocrine functions (growth hormone, cortisol), improved autonomic function/HRV; psychological: anti-depressant effects, elevated BDNF, homeostatic regulation.

Benefits for Tai Chi/Qigong enthusiasts: Gentle movements cultivate Qi and mindfulness, fostering relaxation and energy harmony, which can improve sleep by aligning internal energies and reducing daily stress.

**Strengths:** Rigorous methods, subgroup analyses for heterogeneity, focus on diagnosed insomnia.

**Limitations:** High bias risk (blinding, allocation), small samples, exercise variety, lack of Tai Chi specifics (style, intensity).

**Clinical recommendations:** Tai Chi as adjunct for subjective sleep quality and insomnia severity in adults; standardize protocols for better outcomes.

### *Ee C, et al.,* (2024) [34]

**Study design:** Review of lifestyle and integrative oncology interventions for cancer-related fatigue and sleep disturbances.

**Participant details:** Not specified in available content; focuses on cancer patients.

**Intervention protocols:** Tai Chi and Qigong mentioned as interventions; no specific duration, frequency, or type detailed.

**Key findings with statistical data:** Insufficient content; general mention of potential benefits for sleep in cancer.

**Potential mechanisms for medical professionals:** Not detailed; may involve reduced inflammation and stress modulation.

**Benefits for Tai Chi/Qigong enthusiasts:** Practices promote Qi flow and holistic well-being, aiding sleep by enhancing vitality and emotional balance in cancer recovery.

**Strengths:** Broad review of integrative approaches.

**Limitations:** Lack of specific data on Tai Chi/Qigong effects.

Clinical recommendations: Consider Tai Chi/Qigong for cancer-related sleep issues; more research needed.

### *Garland SN, et al.,* (2019) [35]

**Study design:** Review on integrative approaches for sleep health in cancer survivors.

**Participant details:** Not specified; cancer survivors with sleep issues.

**Intervention protocols:** Qigong/Tai Chi mentioned; no specifics on duration, frequency, type.

**Key findings with statistical data:** Insufficient content; general evidence for benefits.

**Potential mechanisms for medical professionals:** Not detailed; possibly psychological relaxation and physiological calming.

Benefits for Tai Chi/Qigong enthusiasts: Cultivates Qi and mindfulness, improving sleep through energy alignment and serene practice.

**Strengths:** Highlights integrative options.

**Limitations:** Lacks detailed data.

**Clinical recommendations:** Explore Qigong/Tai Chi for sleep in cancer survivors; further studies required.

### *Hanzhou L, et al.,* (2024) [36]

**Study design:** Bibliometric study on global trends in nondrug treatments for insomnia.

**Participant details:** Not applicable; analyzes literature trends.

**Intervention protocols:** Tai Chi/Qigong noted as research frontiers; no specifics.

**Key findings with statistical data:** Insufficient; Tai Chi/Qigong highlighted post-2021, no stats.

**Potential mechanisms for medical professionals**: Not detailed.

**Benefits for Tai Chi/Qigong enthusiasts:** Enhances Qi cultivation, promoting natural sleep through balanced energy.

**Strengths:** Identifies trends.

**Limitations:** No clinical data.

**Clinical recommendations:** Consider Tai Chi/Qigong in nondrug insomnia research.

### *He J, et al.,* (2024) [37]

**Study design:** Randomized controlled trial with four groups: Tai Chi + active rTMS, Tai Chi + sham rTMS, Tai Chi alone, exercise control.

**Participant details:** 152 older adults, mean age 67.68±4.98 years, 73.68% female, with sleep disturbance; subsets with/without depression.

**Intervention protocols:** 4 weeks of Tai Chi (type not specified); frequency/duration not detailed.

**Key findings with statistical data:** Tai Chi + active rTMS reduced sleep onset latency and improved efficiency vs sham/controls at post and 3 months (no specific stats like SMD/p/CI provided).

**Potential mechanisms for medical professionals:** Not detailed; may involve neural modulation and relaxation.

**Benefits for Tai Chi/Qigong enthusiasts:** Builds Qi and resilience, aiding sleep via combined mind-body stimulation.

**Strengths:** Long follow-up, depression subgroup analysis.

**Limitations:** No protocol details, stats lacking.

**Clinical recommendations:** Tai Chi, alone or with rTMS, for older adults' sleep; consider depression status.

### *Irwin MR, et al.,* (2024) [38]

**Study design**: Randomized clinical trial comparing Tai Chi to CBT-I, with 15-month follow-up.

**Participant details:** 90 breast cancer survivors with insomnia; age/sex not specified.

**Intervention protocols:** 3 months of Tai Chi; frequency not detailed.

**Key findings with statistical data:** Tai Chi reduced IL-6 ($p<0.05$), TLR-4 monocyte IL-6/TNF ($p<0.01$), CTRA profile ($p<0.01$); greater than CBT-I in some inflammation markers.

**Potential mechanisms for medical professionals:** Reduces systemic/cellular inflammation via IL-6/TNF decreases, gene expression modulation (anti-inflammatory, anti-viral).

**Benefits for Tai Chi/Qigong enthusiasts:** Cultivates Qi to reverse inflammation, enhancing sleep and vitality in cancer recovery.

**Strengths:** Long follow-up, biomarker measures.

**Limitations:** No age/sex/frequency details.

**Clinical recommendations:** Tai Chi for insomnia in breast cancer survivors to reduce inflammation; Comparable to CBT-I.

### *Irwin MR, et al.,* (2014) [39]

**Study design:** Randomized comparative efficacy trial comparing Tai Chi Chih (TCC), CBT, and sleep seminar control.

**Participant details:** 123 older adults (>55 years) with chronic primary insomnia per DSM-IV-TR/ICSD; sex not detailed.

**Intervention protocols:** TCC: 2-hour weekly group sessions for 4 months, repetitious slow-paced movements; home practice

3.3-2.3 days/week.

**Key findings with statistical data:** TCC improved sleep quality, fatigue, depression vs control at 2/4/7 months ($p<0.05$), not at 16 months; no insomnia remission ($d=0.10$-$0.54$); no PSG effects; no CRP reduction (OR 0.8, 95% CI 0.25-2.5, $p=0.47$).

**Potential mechanisms for medical professionals:** Targets arousal via movement/meditation, reducing sympathetic activity and β-adrenergic signaling, lowering proinflammatory cytokines.

**Benefits for Tai Chi/Qigong enthusiasts:** Promotes Qi flow through gentle motions, achieving tranquility and energy balance for sustained sleep improvement.

**Strengths:** Large trial, long follow-up, high acceptability (94%).

**Limitations:** No blinding, single therapists, limited generalizability, no PSG effects.

**Clinical recommendations:** TCC for sleep quality/fatigue in older adults; not primary for remission (prefer CBT).

### *Irwin MR, et al.,* (2017) [40]

**Study design:** Randomized partially blinded noninferiority trial comparing Tai Chi Chih (TCC) to CBT-I, assessments at 2/3/6/15 months.

**Participant details:** 90 breast cancer survivors (aged 42-83 years, likely female) with DSM-IV-TR/ICSD insomnia, post-treatment ≥6 months.

**Intervention protocols:** TCC: weekly 120-minute group sessions for 3 months, mindful slow-paced movement meditation.

**Key findings with statistical data:** Insomnia response 46.7% TCC vs 43.7% CBT-I at 15 months ($p=0.82$, $d=-0.07$); noninferior (mean 0.52, CI 2.36, $p=0.02$); remission 37.9% vs 46.2% ($p=0.62$, $d=0.18$); large effects on sleep quality ($d=1.21$, $p<0.001$); no PSG effects ($p>0.10$).

Potential mechanisms for medical professionals: Reduces sympathetic arousal and inflammation influencing sleep.

**Benefits for Tai Chi/Qigong enthusiasts:** Fosters Qi harmony and meditative focus, aiding long-term sleep in cancer survivors.

**Strengths:** Blinded protocol, matched exposure, no-treatment lead-in.

**Limitations:** Mostly white/educated women, no PSG effects, higher TCC dropout.

**Clinical recommendations:** TCC as scalable option for insomnia in breast cancer survivors, noninferior to CBT-I.

### *Kligler B, et al.,* (2016) [41]

**Study design:** Review of evidence for complementary/integrative therapies.

**Participant details:** Not specified; general for insomnia.

**Intervention protocols:** Tai Chi/Qigong mentioned; no specifics.

**Key findings with statistical data:** Insufficient; may help insomnia, no stats.

**Potential mechanisms for medical professionals:** Not detailed.

**Benefits for Tai Chi/Qigong enthusiasts:** Qi cultivation for relaxation and sleep.

**Strengths:** Evidence overview.

**Limitations:** Brief mention.

**Clinical recommendations:** Consider for insomnia.

## Concluding Comments

Taken together, the protocols, randomized controlled trials, systematic reviews, and narrative overviews included in this article show that tai chi and qigong have become firmly embedded in the broader landscape of non-pharmacological treatments for insomnia and sleep disturbance. Across heterogeneous designs and populations, these practices are consistently associated with improvements in subjective sleep measures, and in some cases demonstrate effects comparable to established behavioral therapies such as CBT-I. The evidence base also suggests that tai chi can be integrated into complex interventions—for example, combined with mindfulness training, lifestyle counseling, or neuromodulation techniques—without sacrificing acceptability or safety.

At the same time, the insomnia literature on tai chi and qigong is far from uniform. Many studies rely primarily on self-report instruments, with limited use of polysomnography or actigraphy, and details about style, intensity, and progression of practice are not always fully documented. Several trials report minimal or no change in objective sleep parameters even when subjective sleep quality improves, raising questions about mechanisms and the clinical significance of different outcome domains. In addition, sample sizes are often modest, follow-up periods vary widely, and there is relatively little head-to-head comparison among different tai chi and qigong forms. These limitations indicate that stronger, more standardized research designs are needed to clarify dose–response relationships and to identify which insomnia phenotypes are most responsive to these interventions.

From a practical standpoint, tai chi and qigong offer several advantages for insomnia management that extend beyond sleep itself. They can be delivered in community or clinical settings, adapted for seated or low-impact practice, and scaled through group classes, online formats, or hybrid models that combine in-person instruction with home-based training. For older adults, cancer survivors, and individuals with multiple comorbidities, these features make tai chi and qigong realistic options for long-term self-management, with the potential to address fatigue, mood, balance, and quality of life alongside sleep. For clinicians, incorporating tai chi and qi-

gong into care pathways can diversify the portfolio of evidence-informed, non-drug options available to patients who are reluctant to rely on sedative medications or who have reached the limits of pharmacotherapy.

One distinctive element of the present project is its explicit use of artificial intelligence as a tool for structuring and summarizing the literature. By leveraging AI to extract and organize key information from complex reports, it becomes possible to maintain an up-to-date overview of a rapidly evolving field and to generate clinically relevant summaries in a time-efficient manner. Future research could build on this model by integrating AI-assisted screening and data extraction into formal systematic reviews and meta-analyses, or by developing AI-based clinical decision aids that translate the insomnia evidence on tai chi and qigong into point-of-care guidance. As both the tai chi/qigong and AI literatures continue to grow, such integrative approaches may help bridge the gap between traditional Chinese medicine and contemporary, evidence-based sleep medicine.

## Acknowledgement

None.

## Conflict of Interest

None.

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