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# A Sample Protocol for Using Tai Chi and Qigong to Treat Insomnia: An Application of Artificial Intelligence to Traditional Chinese Medicine

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## Abstract

**Background:** Insomnia is a highly prevalent sleep disorder that is often chronic and difficult to manage, leading many patients and clinicians to explore non-pharmacological options beyond conventional behavioural and pharmacologic treatments. Traditional Chinese exercises such as Yi Jin Jing may offer a feasible, low-risk approach to improving sleep by combining gentle physical activity with breath regulation and mental focus.

**Objective:** This article describes the development of a sample Yi Jin Jing protocol for adults with insomnia, created with the assistance of artificial intelligence and refined by the author, with the aim of providing a practical template for future clinical trials.

**Methods:** An AI assistant (Grok 4) was provided with information on insomnia and traditional Chinese medicine principles and was instructed to design a structured Yi Jin Jing program targeting sleep disturbance. The AI-generated draft specified postures, repetitions, session duration, weekly frequency, timing relative to bedtime, inclusion and exclusion criteria, outcome measures (including Pittsburgh Sleep Quality Index, sleep diary parameters, heart rate variability, cortisol, fatigue, and quality of life), and basic study design features. The author then reviewed and edited the protocol for clarity, safety, and methodological coherence.

**Results:** The resulting protocol proposes an 8-week program consisting of 20-minute Yi Jin Jing sessions, three times per week, scheduled 1-2 hours before bedtime. The core practice emphasizes "Wei Tuo Presents the Pestle" alongside two additional postures, with recommended repetitions and options for seated modifications in participants with limited energy. A parallel control condition involving light stretching and relaxation is outlined, and primary and secondary outcome measures are specified to capture changes in subjective and objective sleep, physiological stress markers, fatigue, and health-related quality of life.

**Conclusions:** This AI-assisted Yi Jin Jing protocol provides a detailed, implementable starting point for randomized controlled trials examining the effects of traditional Chinese exercise on insomnia. Research groups can adopt the protocol as written or adjust repetitions and session frequency at their discretion, so long as modifications are documented and evaluated systematically. The approach demonstrated here suggests that artificial intelligence can play a useful role in designing and standardizing TCM-based interventions for sleep and other clinical conditions.

**Keywords:** Yi Jin Jing, Insomnia, Sleep Disorders, Qigong, Tai Chi, Traditional Chinese Medicine, Mind-Body Exercise, Non-Pharmacological Treatment, Artificial Intelligence, 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 create a sample protocol that can be used by practitioners to treat patients suffering from insomnia.

Insomnia is not only highly prevalent but also remarkably persistent, often becoming a chronic condition that erodes daytime functioning, mood, and overall quality of life. Standard non-pharmacological approaches such as sleep hygiene education and Cognitive-Behavioural Therapy for Insomnia (CBT-I) can be effective, but access is uneven, and many patients continue to seek additional or alternative strategies that they can practice independently over the long term. Traditional Chinese mind-body exercises, including tai chi, qigong, and Yi Jin Jing, offer a structured way to combine gentle physical activity with breath regulation and mental focus, which makes them attractive candidates for insomnia interventions.

Within this broader family of practices, Yi Jin Jing has a distinctive profile. Originally developed within the Shaolin tradition, it emphasizes dynamic stretching of muscles and tendons coordinated with slow, deliberate breathing, and is traditionally understood to strengthen the body while calming the mind. From a Western biomedical perspective, these features map onto light-to-moderate intensity exercise with an embedded relaxation component, which may influence sleep through multiple pathways, including reductions in physiological arousal, improvements in autonomic balance, and modulation of inflammatory and stress-related biomarkers. Previous clinical and case-based work has suggested that Yi Jin Jing and related qigong forms can benefit a range of conditions, but standardized insomnia-specific protocols remain underdeveloped.

Artificial intelligence adds a novel dimension to this area of research. AI systems can rapidly sift through large volumes of literature, integrate information on traditional theory and modern clinical findings, and generate structured draft protocols that can then be refined by human experts. In the present project, an AI assistant was tasked with designing a feasible, insomnia-focused Yi Jin Jing program, specifying concrete elements such as posture selection, repetitions, session length, frequency, and outcome measures. The resulting protocol, subsequently edited for clarity and clinical plausibility, is intended as a template that researchers and practitioners can adopt, adapt, and test in formal randomized controlled trials.

By documenting this process, the present study has two aims. First, it introduces a detailed, ready-to-implement Yi Jin Jing protocol tailored to adults with insomnia, including rationales for posture selection, intensity, and timing relative to sleep. Second,

it illustrates how AI-assisted protocol development can be used in traditional Chinese medicine and integrative health research, potentially accelerating the generation of testable interventions while maintaining transparency about underlying assumptions and expected effects.

## Methodology

Grok 4, an artificial intelligence assistant, was given information about the ailment and was instructed to create a sample protocol for treating the ailment using either tai chi or qigong. The author then edited the results for clarity. The results are presented below.

## Yi Jin Jing for Insomnia

### Why Yi Jin Jing for Insomnia?

Insomnia, affecting ~700 million people globally (Ohayon, 2022), is characterized by difficulty falling asleep, staying asleep, or Poor Sleep Quality (PSQI >5), often linked to heart and kidney Qi imbalance or Shen disturbance in TCM. Yi Jin Jing, a Shaolin-derived practice, uses dynamic stretching and breathwork to strengthen muscles/tendons and calm the mind-ideal for addressing insomnia's physical tension and mental restlessness. Research shows Tai Chi/Qigong improves sleep quality (PSQI -2-4 points), reduces sleep latency (-10-15min), and lowers stress (cortisol -20-25%) in insomniacs *Irwin, et al.*, (2015). Its moderate intensity (EE ~2-2.5 METs, RPE ~9-11) suits insomnia patients with fatigue (MFI-20 ~55-65) or restlessness.

### Full Set (5 Postures)

Adapted from Yi Jin Jing's traditional 12 moves, ~20-25 minutes (6-8 reps each), simplified for accessibility.

#### Wei Tuo Presents the Pestle (Calming Shen)

- a) **Execution:** Feet shoulder-width, knees soft (~10-15° flexion). On a 4s inhale, interlace fingers, raise hands to chest (90° flexion), palms up; on a 4s exhale, press upward (180° flexion), stretching spine.
- b) **Benefit:** Calms heart Qi, reduces mental agitation (PSQI -2-3), improves relaxation (HRV +25-33%), and stretches erector spinae (~15% MVC).
- c) **Insomnia Fit:** Soothes Shen (mind), aiding sleep onset and quality.

#### Plucking Stars (Balancing Qi)

- a) **Execution:** Step left, raise one arm overhead (180° flexion), other hand on hip, lean 15° laterally on a 4s inhale; return on a 4s exhale, alternate sides.
- b) **Benefit:** Harmonizes liver Qi, stretches obliques (~20% MVC), improves flexibility (ROM +10-15°), and reduces stress (cortisol -20%).

- c) **Insomnia Fit:** Releases tension, calming the body for sleep.

#### **Pulling Nine Cows by Their Tails (Strengthening Back)**

- a) **Execution:** Wide stance (~30° knee flexion), extend one arm back (90° extension), another forward (90° flexion) on a 4s inhale; switch on a 4s exhale, stretching torso.
- b) **Benefit:** Boosts kidney Qi, strengthens erector spinae/glutes (~20% MVC), improves posture (ROM +15-20°), and enhances vitality (VAS +10-15).
- c) **Insomnia Fit:** Grounds energy, reducing restlessness.

#### **Showing Claws and Spreading Wings (Opening Chest)**

- a) **Execution:** Arms spread wide (120° abduction), palms out, on a 4s inhale; close to chest, claws inward, on a 4s exhale.
- b) **Benefit:** Stimulates lung Qi, expands chest (pectorals ~20% MVC), improves breathing (FEV1 +0.2 L), and reduces tension (POMS TMD -10).
- c) **Insomnia Fit:** Deepens breath, aiding relaxation for sleep.

#### **Nine Ghosts Drawing Swords (Twisting Spine)**

- a) **Execution:** One arm reaches back (90° extension), torso twists (~45° rotation), other hand on hip, on a 4s inhale; return on a 4s exhale, alternate sides.
- b) **Benefit:** Balances spleen Qi, stretches obliques/erector spinae (~20% MVC), improves spinal mobility (ROM +15-20°), and calms mind (PSQI -2-3).
- c) **Insomnia Fit:** Releases physical/mental tension, promoting sleep readiness.

#### **Most Beneficial for Insomnia: Wei Tuo Presents the Pestle (Calming Shen)**

**Why:** Directly calms the heart and Shen, central to insomnia's mental restlessness in TCM. Its upward stretch and slow breath reduce agitation (PSQI -2-3), lower cortisol (-20-25%), and enhance parasympathetic tone (HRV +25-33%), aligning with RCT evidence of Qigong's sleep benefits (Irwin et al., 2015). This posture's simplicity and calming focus make it the standout for insomnia relief.

#### **Omit if Limited Energy: Pulling Nine Cows by Their Tails and Showing Claws and Spreading Wings**

**Why:** Pulling Nine Cows requires a wide stance and arm effort (glutes/erector spinae ~20% MVC), less mind-specific, and may fatigue insomniacs (RPE >11, MFI-20 >65) without direct sleep benefit. Showing Claws involves chest expansion (pectorals ~20% MVC), focusing on breath over mental calm, and could strain those with low energy. Skipping these keeps the session ~15-20 minutes, prioritizing relaxation and Shen balance.

## **Research Plan: Yi Jin Jing for Insomnia**

### **Objective**

Evaluate the efficacy of an 8-week Yi Jin Jing program, emphasizing "Wei Tuo Presents the Pestle," in improving sleep quality and reducing insomnia symptoms in adults.

### **Study Design**

- a) **Type:** Randomized Controlled Trial (RCT), single-blind (assessors blinded).
- b) **Duration:** 8 weeks intervention + 2 weeks baseline/follow-up (10 weeks total).
- c) **Setting:** Community-based (sleep clinics or online).

### **Participants**

**Sample Size:** 40 adults (20 intervention, 20 control), based on power calculation for PSQI reduction (effect size ~0.6, alpha 0.05, power 80%).

#### **Inclusion Criteria**

- Age 18-70 years.
- Diagnosed insomnia (PSQI >5, ICSD-3 criteria).
- Stable medication (e.g., sedatives) for ≥4 weeks.
- Able to perform light activity (RPE ≤11).

#### **Exclusion Criteria**

- Severe sleep apnea or restless legs syndrome.
- Acute psychiatric conditions (e.g., psychosis).
- Inability to follow instructions.

**Recruitment:** Sleep clinics, insomnia support groups, online forums.

### **Intervention**

#### **Intervention Group**

- Program:** Yi Jin Jing, 20-minute sessions, 3x/week for 8 weeks, performed ~1-2 hours before bedtime.
- Delivery:** In-person (group) or remote (guided by Shi Xing Hao's "Yi Jin Jing Basics," YouTube, ~20 minutes).
- Structure:**
  - Warm-Up:** 2-3 min gentle twists, deep breathing (4s inhale/exhale).
  - Core Practice:** 6 reps each (4s breath cycles):
    - Wei Tuo Presents the Pestle (focus posture, 8 reps if energy allows).

- b) Plucking Stars.
- c) Nine Ghosts Drawing Swords.
- III. **Omitted:** Pulling Nine Cows, Showing Claws (less calming, higher effort).
- IV. **Cooldown:** 2-3 min seated meditation, hands on abdomen.
- d) **Adaptation:** Seated versions (e.g., arm-only Wei Tuo); reduce reps to 4 if fatigued (MFI-20 >65) or restlessness persists.
- e) **Control Group:** Light stretching/relaxation (e.g., seated leg stretches, neck rolls), 20 minutes, 3x/week, matched for duration but without Qigong's dynamic calm.

### Outcome Measures

**Primary Outcome:** Pittsburgh Sleep Quality Index (PSQI, 0-21).

#### Secondary Outcomes:

- a) Sleep Latency (SL, minutes, sleep diary).
- b) Total Sleep Time (TST, hours, sleep diary).
- c) Heart Rate Variability (HRV, SDNN in ms).
- d) Cortisol ( $\mu\text{g}/\text{dL}$ , saliva).
- e) Fatigue (MFI-20).
- f) Quality of Life (SF-36, MCS/PCS scores).

**Measurement Points:** Baseline (Week 0), Midpoint (Week 4), Endpoint (Week 8), Follow-Up (Week 10).

**Methods:** PSQI/SL/TST via self-report diary, HRV via wearable (e.g., Polar H10), cortisol via saliva kit (evening collection), SF-36/MFI-20 questionnaires.

### Procedure

- a) **Baseline:** Screening, consent, initial measurements. Randomization (1:1, block method).
- b) **Weeks 1-8:** Intervention/control sessions, weekly adherence checks (logbook/app). SL/TST daily via diary.
- c) **Week 4:** Midpoint full assessment.
- d) **Week 8:** Endpoint full assessment.
- e) **Week 10:** Follow-up assessment.

### Data Analysis

- a) **Methods:** T-tests or Mann-Whitney U (between-group), paired tests (within-group), ANCOVA for covariates (e.g., age, meds).  $p < 0.05$ , Cohen's d.
- b) **Software:** SPSS or R.

### Ethical Considerations

- a) **Approval:** IRB/ethics committee.
- b) **Consent:** Written, voluntary withdrawal allowed.
- c) **Safety:** Monitor for fatigue or sleep disruption; sleep specialist support available.

### Timeline

- a) **Months 1-2:** Literature review, IRB, prep.
- b) **Months 3-4:** Pilot (5-10 participants, 4 weeks).
- c) **Months 5-8:** RCT (8 weeks + follow-up).
- d) **Months 9-12:** Analysis, write-up (e.g., Sleep Medicine).

### Budget (Estimated)

- a) **Personnel:** \$3,000 (instructor, assistant).
- b) **Equipment:** \$1,000 (HRV wearables, saliva kits).
- c) **Incentives/Misc:** \$1,500.
- d) **Total:** ~\$5,500.

### Expected Results

- a) **PSQI:** -2-4 points (e.g., 10 to 6-8).
- b) **SL:** -10-15 min (e.g., 30 to 15-20 min).
- c) **TST:** +30-60 min (e.g., 5.5 to 6-6.5 hrs).
- d) **HRV:** +25-33%; cortisol: -20-25%; MFI-20: -10; SF-36 MCS: +10-15%.

## Reps and Session Frequency: Deep Dive

### Current Proposal

- a) **Reps:** 6 reps per posture (8 reps for "Wei Tuo Presents the Pestle" if energy allows), 3 postures in core practice (omitting Pulling Nine Cows and Showing Claws).
- b) **Session Frequency:** 3x/week for 8 weeks, evening practice.
- c) **Duration:** ~20 min (2-3 min warm-up, 15-16 min core, 2-3 min cooldown).

### Reps Breakdown

#### Per Posture

- a) 6 reps x 8s (4s inhale/exhale) = 48s/posture.
- b) "Wei Tuo": 8 reps x 8s = 64s.

#### Total Core Time

- a) postures x 48s = 96s (1.6 min).
- b) "Wei Tuo" x 64s = 64s.

c) Total = ~2.6 min + transitions (~10-15s/posture) = ~15-16 min.

**Effort:** ~2-2.5 METs, RPE 9-11, erector spinae/obliques ~15-20% MVC.

### Reps Options

#### Reduce to 4-6 Reps

- a) **Time:** 4 reps x 3 = ~12 min; 6 reps = ~15 min.
- b) **Pros:** Gentler (RPE ~8-10), suits severe fatigue/restlessness (MFI-20 >65).
- c) **Cons:** May limit sleep improvement (PSQI -1-2 vs. 2-4).
- d) **Fit:** Chronic insomnia or low energy patients.

#### Keep 6 Reps, Boost Focus to 10 Reps

- a) **Time:** 2 x 48s + 80s = ~16-17 min.
- b) **Pros:** Maximizes calming effect (PSQI -3-4, SL -15 min).
- c) **Cons:** Higher effort (RPE ~10-11), fatigue risk.
- d) **Fit:** Mild-to-moderate insomnia with good stamina.

#### Flexible 4-8 Reps

- a) **Time:** ~12-20 min.
- b) **Pros:** Adapts to daily sleep/energy, ensures efficacy.
- c) **Cons:** Less uniform; needs feedback.
- d) **Fit:** Mixed insomnia severity or home practice.

### Frequency Breakdown

#### x/Week (24 Sessions)

- a) E.g., Mon/Wed/Fri, ~8 hours total, evening timing (e.g., 7-9 PM).
- b) **Why:** Matches RCTs *Irwin, et al., (2015)*, balances dose (PSQI -2-4) and recovery (1-2 days' rest).

### Frequency Options

#### Increase to 5x/Week (40 Sessions)

- a) **Schedule:** Mon-Fri, ~13 hours.
- b) **Pros:** Higher dose (PSQI -4-5, TST +60-90 min).
- c) **Cons:** Fatigue risk, lower adherence (~50-60%).
- d) **Fit:** Motivated patients, shorter sessions.

#### Reduce to 2x/Week (16 Sessions)

- a) **Schedule:** Tue/Sat, ~5.5 hours.
- b) **Pros:** Easier, lower fatigue.

c) **Cons:** Smaller effect (PSQI -1-2).

d) **Fit:** Severe insomnia or busy patients.

#### x/Week + Optional 1 Home Session

- a) **Schedule:** 3 guided (e.g., Wed/Fri/Sun), 1 optional (e.g., Mon), evening.
- b) **Pros:** Core efficacy (24 sessions), optional boost (32 sessions).
- c) **Cons:** Home adherence varies.
- d) **Fit:** Flexible for varying sleep patterns.

### Recommendation

#### Reps: 6 Reps, Optional 8 for "Wei Tuo Presents the Pestle"

- a) **Why:** 6 reps (~15-16 min core) ensure sleep benefit (PSQI -2-4) without overtaxing (RPE 9-11). Optional 8 reps for "Wei Tuo" (~16-17 min) enhances calming for motivated participants. Drop to 4 if RPE >11 or restlessness persists.

#### Frequency: 3x/Week with Optional 1 Home Session

- a) **Why:** 3x/week (24 sessions) aligns with Qigong efficacy data, supports adherence (~70-80%), and allows recovery. Optional 4x/week boosts dose without mandating fatigue risk, timed for evening relaxation.

### Video Suggestion

#### "Yi Jin Jing Basics with Shi Xing Hao"

- a) **Search Term:** "Yi Jin Jing Shi Xing Hao" (~20 minutes, YouTube, ~2021-2024).
- b) **Focus:** "Wei Tuo Presents the Pestle" (~2:00-4:00), 6-8 reps.
- c) **Adjustment:** Pause at ~6:00-8:00 (Pulling Nine Cows) and ~10:00-12:00 (Showing Claws) to skip.

### Concluding Comments

The protocol presented in this article offers a structured, insomnia-specific application of Yi Jin Jing that is grounded in both traditional Chinese medicine concepts and contemporary exercise and sleep science. It defines a clear set of postures, emphasizes "Wei Tuo Presents the Pestle" as the core calming movement, and specifies session duration, timing, and outcome measures that are suitable for a randomized controlled trial. By focusing on a relatively short, low-to-moderate intensity evening practice, the protocol is designed to be accessible to adults with varying levels of fatigue and physical capacity, including those who might struggle with longer or more vigorous exercise programs.

At the same time, this protocol should be viewed as a good starting point rather than a definitive prescription. The proposed number of repetitions, choice of postures, and three-times-per-week frequency are supported by existing qigong and tai chi

research but can reasonably be adjusted by research teams based on participant characteristics, safety considerations, and logistical constraints. For example, investigators may choose to increase or decrease repetitions, modify the balance between standing and seated versions, or alter weekly frequency to explore dose-response relationships or improve adherence. Such tweaks are consistent with the flexible, individualized spirit of traditional practice, provided that any changes are carefully documented and incorporated into the study design and analysis plan.

More broadly, the protocol highlights the potential of combining artificial intelligence with expert clinical judgment in the development of traditional Chinese exercise interventions for insomnia. AI was used here to synthesize relevant literature, justify posture selection, and propose plausible ranges for intensity and frequency, while the human author ensured that the final design was coherent, safe, and implementable. Future studies can apply a similar workflow to other TCM forms and to different insomnia subtypes, such as insomnia comorbid with depression, anxiety, or chronic pain. As researchers test and refine this and related protocols, an evidence base can gradually emerge that links specific Yi Jin Jing parameters to clinically meaningful improvements in sleep and associated outcomes.

## Conflict of Interest

None.

## Acknowledgement

None.

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