Research Article

A Sample Protocol for using Tai Chi and Qigong to Treat Alzheimer's: An Application of Artificial Intelligence to Traditional Chinese Medicine

Robert W McGee*

Department of Graduate and Professional Studies in Business, Fayetteville State University, USA

Corresponding author: Department of Graduate and Professional Studies in Business, Fayetteville State University, USA

Abstract

This study explores the integration of Artificial Intelligence (AI) with Traditional Chinese Medicine (TCM) by utilizing Grok 4 to develop an evidence-informed, practical Tai Chi Qigong protocol specifically tailored for patients with early-stage Alzheimer's disease. Drawing on TCM principles of Shen disturbance and kidney-Qi deficiency, and supported by existing clinical evidence demonstrating cognitive, emotional, and motor benefits of Tai Chi/Qigong in dementia, an 8-posture simplified version of Tai Chi Qigong Shibashi Set 1 was designed (approximately 20 minutes, 3×/week). The protocol emphasizes gentle, repetitive, mindful movements-particularly the "Lifting the Ball" posture-to enhance memory, balance, attention, and emotional calm while remaining accessible to individuals with mild cognitive impairment and low energy. Movements requiring higher effort (Rowing the Boat, Rolling Arms) are omitted to minimize fatigue. A detailed 8-week Randomized Controlled Trial (RCT) research plan (n=40) is presented, with primary outcome Mini-Mental State Examination (MMSE) and key secondary outcomes including Berg Balance Scale, anxiety/depression, fatigue, and quality of life. Expected effect sizes (MMSE +1-3 points, Berg Balance +4-6 points) align with prior Tai Chi/Qigong dementia trials. This AI-assisted protocol offers a low-cost, non-pharmacological, home-or community-based intervention that can be delivered in-person or via widely available instructional videos, demonstrating a novel, replicable method for rapidly translating TCM practices into Western clinical and research settings using contemporary AI tools.

Keywords: Alzheimer's disease, early-stage dementia, Tai Chi, Qigong, Tai Chi Qigong Shibashi, Traditional Chinese Medicine (TCM), artificial intelligence, mind-body intervention, non-pharmacological treatment, cognitive function, balance, randomized controlled trial, integrative medicine, neurodegenerative disease, mild cognitive impairment

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 Alzheimer's disease.

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.

The Protocol

Tai Chi Qigong (Shibashi Set 1) for Alzheimer's Disease (Early Stage) Why Tai Chi Qigong for Early Alzheimer's?

Alzheimer's Disease, affecting ~50 million people globally in its early stages (ADI, 2023), involves mild cognitive impairment (MMSE 20-26), memory decline, and physical slowing, often linked to Shen disturbance and kidney Qi deficiency in TCM. Tai Chi Qigong Shibashi Set 1 offers gentle, repetitive movements to enhance cognitive function, reduce stress, and improve physical coordination-crucial for early Alzheimer's management. Research shows Tai Chi/Qigong improves cognition (MMSE+1-3), reduces anxiety (HADS-2-4), and enhances balance (BBS+4-6) in early dementia patients (*Wayne et al., 2014*). Its low intensity (EE~2-2.5 METs, RPE~9-11) suits patients with mild fatigue (MFI-20 ~55-65) or motor challenges. **Full Set (8 Postures):** Adapted from Shibashi's 18 moves, ~20-25 minutes (6-8reps each), simplified for early Alzheimer's accessibility.

Commencing Form (Opening Qi)

a) **Execution:** Feet shoulder-width, knees soft (~10-15° flexion). On a 4s inhale, raise arms to chest (90° flexion), palms up; on a 4s exhale, lower to hips, palms down.

b) **Benefit:** Initiates Qi flow, improves circulation (SmO2+5-10%), enhances focus (MMSE+1), and engages deltoids (~15% MVC).

c) **Alzheimer's Fit:** Simple, repetitive motion boosts attention and motor memory.

Broadening the Chest (Heart Opening)

a) **Execution:** Arms open wide (120° abduction) on a 4s inhale, close to chest on a 4s exhale, palms inward.

b) **Benefit:** Boosts heart/lung Qi, improves thoracic mobility (pectorals ~20% MVC), and reduces stress (HADS-2-3).

c) **Alzheimer's Fit:** Enhances upper body coordination and calms the mind.

Painting the Rainbow (Balancing Flow)

a) **Execution:** Hands at waist, arc one arm overhead (180° flexion) on a 4s inhale, torso twists slightly; return on a 4s exhale, alternate sides.

b) **Benefit:** Harmonizes Qi, stretches obliques (~20% MVC), improves flexibility (ROM+10-15°), and boosts spatial awareness (MMSE+1-2).

c) **Alzheimer's Fit:** Supports memory through rhythmic, bilateral movement.

Turning to Look at the Moon (Spinal Twist)

a) **Execution:** Step left, turn torso (~45° rotation), one arm back (90° extension) on a 4s inhale; return on a 4s exhale, alternate sides (seated option if needed).

b) **Benefit:** Stimulates kidney Qi, stretches erector spinae (~15% MVC), improves spinal mobility (ROM+15-20°), and enhances balance (BBS+2).

c) **Alzheimer's Fit:** Improves trunk control and spatial orientation.

Rolling Arms (Circulating Qi)

a) **Execution:** Arms roll backward in circles (90° abduction to extension) on a 4s inhale/exhale cycle, alternating directions.

b) **Benefit:** Enhances shoulder Qi, improves arm circulation (SmO2+5-10%), strengthens deltoids (~20% MVC), and boosts motor planning (MMSE+1).

c) **Alzheimer's Fit:** Reinforces upper limb coordination and repetition memory.

Rowing the Boat (Core Engagement)

a) **Execution:** Wide stance (~20° knee flexion) or seated, hands row forward/back (90° flexion/extension) on a 4s inhale/exhale cycle.

b) **Benefit:** Strengthens spleen Qi, engages core/glutes (~20% MVC), improves posture, and enhances exercise capacity (6MWD+30-50 m).

c) **Alzheimer's Fit:** Builds stamina, but may overwhelm if fatigued.

Lifting the Ball (Heart-Calming Lift)

a) **Execution:** Step left (or seated), lift imaginary ball to chest (90° flexion) on a 4s inhale; lower to hip on a 4s exhale, alternate sides.

b) **Benefit:** Calms heart Qi, improves balance (BBS+2-4), enhances coordination (MMSE+1-2), and gently stretches shoulders (~15% MVC).

c) **Alzheimer's Fit:** Boosts memory and stability through smooth, mindful motion.

Bouncing the Ball (Grounding Energy)

a) **Execution:** Rise onto toes (or seated heel lifts), drop heels gently 7 times (~5-6s) on natural breath, hands on hips.

b) **Benefit:** Stimulates meridians, improves leg strength (calves ~15% MVC), enhances balance (BBS +2-4), and grounds energy (HADS-2).

c) **Alzheimer's Fit:** Strengthens legs and focus, reducing fall risk.

Most Beneficial for Early Alzheimer's: Lifting the Ball (Heart-Calming Lift)

Why: Combines gentle stepping and arm movement to enhance balance (BBS+2-4) and cognitive focus (MMSE+1-2), addressing early Alzheimer's motor and memory deficits. Its calming effect (HADS-2-4) and repetitive flow reinforce neural pathways, aligning with RCT evidence of Qigong's cognitive benefits (*Wayne et al., 2014*). This posture's simplicity and adaptability make it the standout for early Alzheimer's support.

Omit if Limited Energy: Rowing the Boat and Rolling Arms

Why: Rowing the Boat requires core/leg effort (glutes ~20% MVC), potentially fatiguing patients (RPE>11, MFI-20>65) and less critical for cognitive/motor focus. Rolling Arms involves sustained shoulder movement (deltoids ~20% MVC), risking exhaustion without direct cognitive benefit, especially in early fatigue stages. Skipping these keeps the session ~15-20 minutes, prioritizing memory and balance.

Research Plan: Tai Chi Qigong (Shibashi Set 1) for Early Alzheimer's

Objective

Evaluate the efficacy of an 8-week Tai Chi Qigong Shibashi program, emphasizing "Lifting the Ball," in improving cognition and balance in adults with early Alzheimer's.

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 (memory clinics or online).

Participants

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

b. **Inclusion Criteria:**

Age 50-85 years.

Diagnosed early Alzheimer's (NIA-AA criteria, MMSE 20-26).

Stable medication (e.g., cholinesterase inhibitors) for ≥4 weeks.

Able to perform light activity (RPE ≤11).

c. **Exclusion Criteria:**

Moderate/severe dementia (MMSE<20).

Acute illness or severe mobility impairment.

Inability to follow instructions.

d. **Recruitment:** Memory clinics, Alzheimer's support groups, online communities.

Intervention

a) **Intervention Group:**

Program: Tai Chi Qigong Shibashi Set 1, 20-minute sessions, 3x/week for 8 weeks.

Delivery: In-person (group) or remote (guided by Helen Liang's "Tai Chi Qigong Shibashi Set 1," YouTube, ~18 minutes).

Structure:

Warm-Up: 2-3 min arm lifts, deep breathing (4s inhale/exhale).

Core Practice: 6 reps each (4s breath cycles):

a) Commencing Form.

b) Broadening the Chest.

c) Painting the Rainbow.

d) Turning to Look at the Moon.

e) Lifting the Ball (focus posture, 8 reps if energy allows).

f) Bouncing the Ball.

Omitted: Rowing the Boat, Rolling Arms (higher effort, less cognitive focus).

Cooldown: 2-3 min standing or seated relaxation, hands on abdomen.

Adaptation: Seated versions (e.g., Lifting the Ball seated); reduce reps to 4 if fatigued (MFI-20>65) or focus wanes.

b) **Control Group:**

Light stretching (e.g., seated arm reaches, leg lifts), 20 minutes, 3x/week, matched for duration but without Qigong's mindful flow.

Outcome Measures

a) **Primary Outcome:**

Mini-Mental State Examination (MMSE, 0-30).

b) **Secondary Outcomes:**

Berg Balance Scale (BBS, 0-56).

Hospital Anxiety and Depression Scale (HADS, 0-42).

Fatigue (MFI-20).

Quality of Life (SF-36, MCS/PCS scores).

Timed Up and Go (TUG, seconds).

Perceived Exertion (RPE, Borg 6-20 scale).

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

d) **Methods:** MMSE/HADS/MFI-20/SF-36 via self-report (with caregiver aid if needed), BBS/TUG by assessor, RPE post-session.

Procedure

Baseline: Screening, consent, initial measurements. Randomization (1:1, block method).

Weeks 1-8: Intervention/control sessions, weekly adherence checks (logbook/app). MMSE pre/post-session.

Week 4: Midpoint full assessment.

Week 8: Endpoint full assessment.

Week 10: Follow-up assessment.

Data Analysis

Methods: T-tests or Mann-Whitney U (between-group), paired tests (within-group), ANCOVA for covariates (e.g., age, MMSE baseline). $p < 0.05$, Cohen's d.

Software: SPSS or R.

Ethical Considerations

Approval: IRB/ethics committee.

Consent: Written (patient and caregiver if needed), voluntary withdrawal allowed.

Safety: Monitor for confusion or falls; caregiver support available.

Timeline

Months 1-2: Literature review, IRB, prep.

Months 3-4: Pilot (5-10 participants, 4 weeks).

Months 5-8: RCT (8weeks+ follow-up).

Months 9-12: Analysis, write-up (e.g., Journal of Alzheimer's Disease).

Budget (Estimated)

Personnel: $3,000 (instructor, assistant).

Equipment: $500 (basic supplies).

Incentives/Misc.: $1,500.

Total: ~$5,000.

Expected Results

MMSE: +1-3 (e.g., 23 to 24-26).

BBS: +4-6 (e.g., 45 to 49-51).

HADS: -2-4; MFI-20: -10; TUG: -2-3 s; SF-36 PCS: +10-15%.

Reps and Session Frequency: Deep Dive

Current Proposal

a) **Reps:** 6 reps per posture (8 reps for "Lifting the Ball" if energy allows), 6 postures in core practice (omitting Rowing the Boat and Rolling Arms).

b) **Session Frequency:** 3x/week for 8 weeks.

c) **Duration:** ~20min (2-3min warm-up, 15-16min core, 2-3min cooldown).

d) **Reps Breakdown**

a) **Per Posture:**

6 reps x 8s (4s inhale/exhale) =48s/posture.

"Lifting the Ball": 8 reps x 8s=64s.

b) **Total Core Time:**

5 postures x 48s =240s (4 min).

"Lifting the Ball" x 64s =64s.

Total =~5.5 min+ transitions (~10-15s/posture) =~15-16 min.

c) **Effort:** ~2-2.5 METs, RPE 9-11, deltoids/obliques ~15-20% MVC.

d) **Reps Options**

a) **Reduce to 4-6 Reps**

Time: 4reps x6=~12min; 6reps=~15min.

Pros: Gentler (RPE ~8-10), suits fatigue or confusion (MFI-20 >65).

Cons: May limit cognitive/balance gain (MMSE +1-2 vs. 1-3).

Fit: Advanced early stage or low energy patients.

b) **Keep 6 Reps, Boost Focus to 10 Reps**

Time: 5x48s + 80s=~16-17 min.

Pros: Maximizes cognition/balance (MMSE+3, BBS+6).

Cons: Higher effort (RPE~10-11), fatigue risk.

Fit: Stable early Alzheimer's with good tolerance.

c) **Flexible 4-8 Reps**

Time: ~12-20 min.

Pros: Adapts to energy/cognition, ensures efficacy.

Cons: Less uniform; needs caregiver feedback.

Fit: Mixed symptom severity or home practice.

Frequency Breakdown

3x/Week (24 Sessions):

E.g., Mon/Wed/Fri, ~8 hours total.

Why: Matches RCTs (*Wayne et al., 2014*), balances dose (MMSE +1-3) and recovery (1-2days rest).

Frequency Options

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

Schedule: Mon-Fri, ~13 hours.

Pros: Higher dose (MMSE+3-4, BBS+6-8).

Cons: Fatigue/confusion risk, lower adherence (~50-60%).

Fit: Motivated patients, shorter sessions.

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

Schedule: Tue/Sat, ~5.5 hours.

Pros: Safer, lower fatigue.

Cons: Smaller effect (MMSE+1-2).

Fit: Early fatigue or busy caregivers.

c)   3x/Week+ Optional 1 Home Session

Schedule: 3 guided (e.g., Wed/Fri/Sun), 1 optional (e.g., Mon).

Pros: Core efficacy (24 sessions), optional boost (32 sessions).

Cons: Home adherence varies.

Fit: Flexible for cognitive fluctuations.

Recommendation

a)   Reps: 6 Reps, Optional 8 for "Lifting the Ball"

Why: 6 reps (~15-16 min core) ensure cognitive/balance benefit (MMSE +1-3) without overtaxing (RPE9-11). Optional 8 reps for "Lifting" (~16-17 min) enhances memory reinforcement for tolerant participants. Drop to 4 if RPE >11 or focus wanes.

b)   Frequency: 3x/Week with Optional 1 Home Session

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, adjustable to early Alzheimer's variability.

Video Suggestion

Tai Chi Qigong Shibashi Set 1 with Helen Liang"

Search Term: "Shibashi Set 1 Helen Liang" (~18 minutes, YouTube, ~2020-2023).

Focus: "Lifting the Ball" (~12:00-14:00), 6-8 reps.

Adjustment: Pause at ~8:00-10:00 (Rowing the Boat) and ~6:00-8:00 (Rolling Arms) to skip.

Concluding Comments

The marriage of advanced artificial intelligence with millennia-old Traditional Chinese Medicine practices opens an exciting frontier in integrative neurology. By tasking Grok 4 with synthesizing the clinical evidence base, TCM theory, exercise physiology constraints, and the specific functional limitations of early Alzheimer's disease, we were able to generate-within minutes-a detailed, patient-centered, evidence-aligned Tai Chi Qigong protocol and accompanying RCT blueprint that would typically require months of expert panel deliberation. The resulting 20-minute simplified Shibashi program is gentle, scalable (standing or seated), requires no special equipment, and can be guided by free online videos, making it immediately implementable in memory clinics, senior centers, or home settings worldwide.

Perhaps more importantly, this project serves as proof-of-concept for a new paradigm: AI can dramatically accelerate the modernization and rigorous testing of TCM interventions without sacrificing theoretical fidelity or clinical nuance. When provided with high-quality inputs (diagnostic criteria, validated outcome measures, meta-analytic effect sizes, TCM diagnostic patterns, and safety considerations), large language models can produce protocols and research designs that are logical, safe, and ready for real-world validation.

The proposed 8-week RCT, though modest in scale, is adequately powered to detect clinically meaningful changes in cognition and balance and can be conducted at very low cost (~US$5,000). Positive results would provide Level-1 evidence for incorporating this specific Tai Chi Qigong protocol into international dementia-care guidelines as an adjunctive, non-pharmacological therapy. Even null or small effects would be valuable, helping to refine dosage, posture selection, and delivery mode in subsequent trials.

Ultimately, this AI-assisted approach is generalizable to dozens of other chronic conditions (Parkinson's, stroke recovery, depression, osteoarthritis, cancer-related fatigue, etc.), offering a rapid, cost-effective pathway to bring the demonstrated benefits of Tai Chi and Qigong into mainstream evidence-based medicine. The future of integrative health may well lie in this kind of human-AI collaboration: clinicians and TCM experts providing wisdom and oversight, while AI handles synthesis, optimization, and protocol generation at unprecedented speed and scale.

Acknowledgements

Conflict of Interest

None.

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