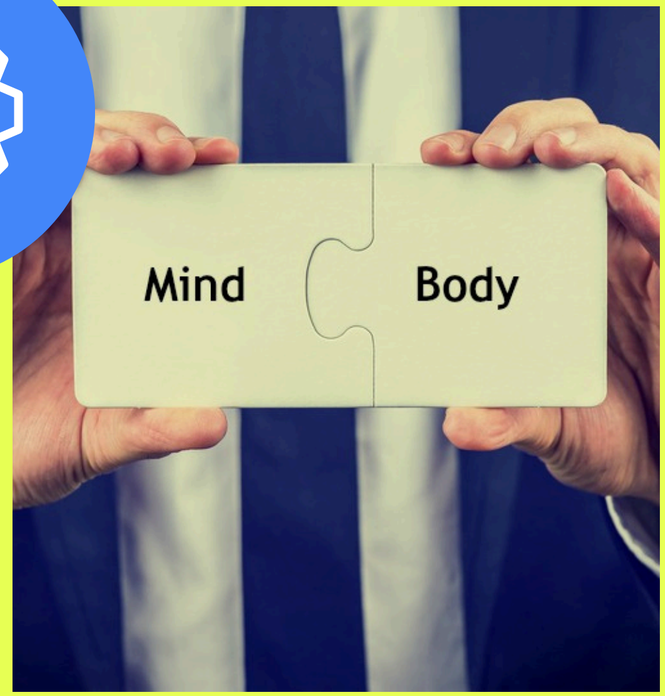
THE EFFECTIVENESS OF MIND BODY EXERCISES (TAICHI, YOGA, QIGONG) ON BALANCE AND MOBILITY AMONG PEOPLE WITH PARKINSON'S DISEASE: A SCOPING REVIEW



Chan Nga Wun

INNOVATIVE APPROACHES TO PRIMARY HEALTHCARE DELIVERY





INTRODUCTION

PARKINSON'S DISEASE

chronic progressive neurodegenerative disorder that primarily affects movement
Mechanism

- A degeneration of dopamine-producing neurons
- Reduced dopamine production
- Impaired regulation of the movement of the body

(Kouli, Torsney & Kuan, 2018)

PREVALENCE OF PARKINSON'S DISEASE

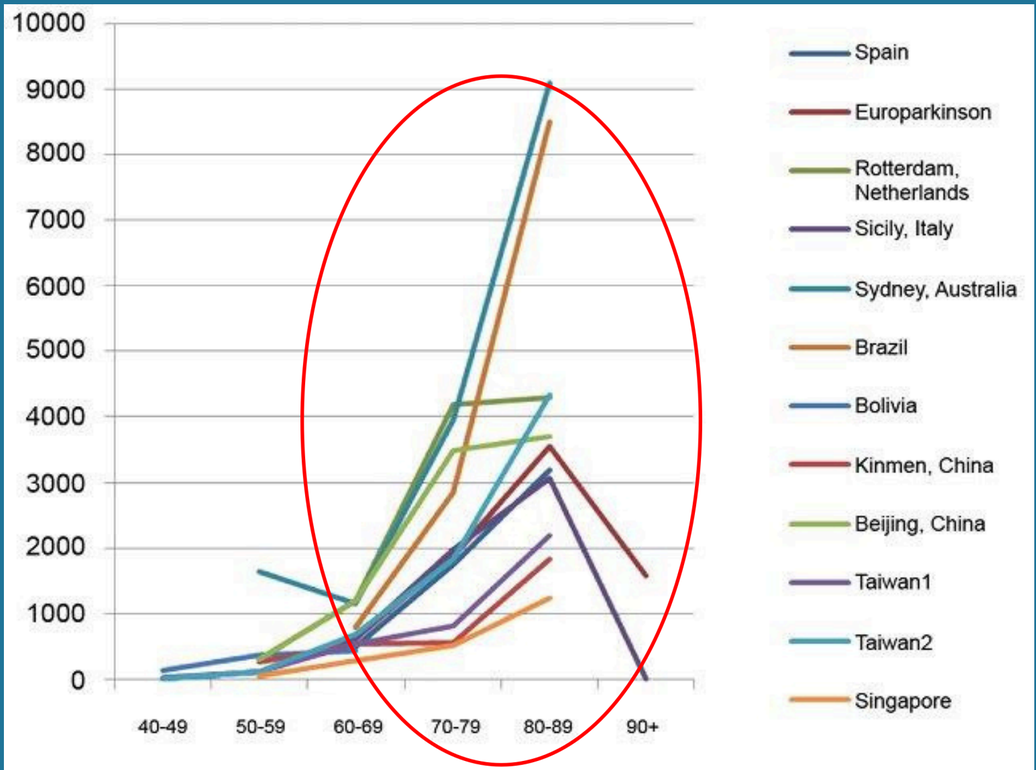


Fig. 1 Age-specific prevalence of Parkinson's disease from door-to-door surveys[8,10,19,20,22-29]

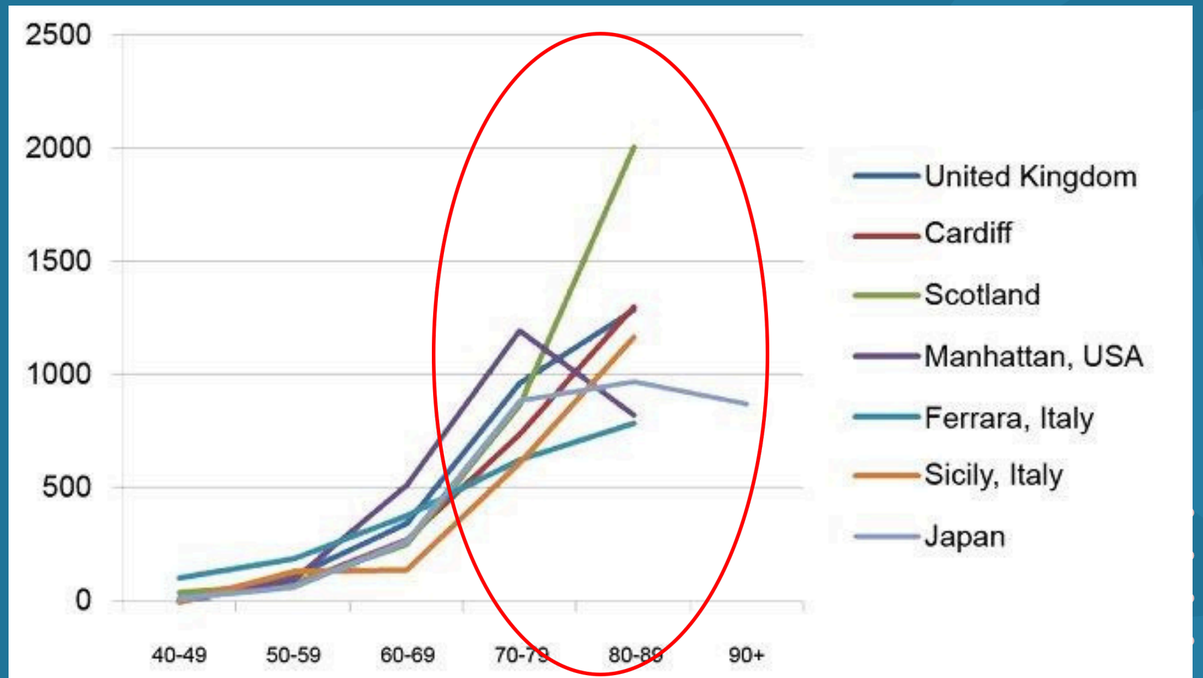


Fig. 2 Age-specific prevalence of Parkinson's disease from record-based studies[30-36]

Age Specific mostly 70-89

(Muangpaisan W; Mathews A; Hori H; Seidel D, 2011)

SYMPTOMS OF PARKINSON'S

Comprises 4 motor features

- Dificult to mange activities of daily living



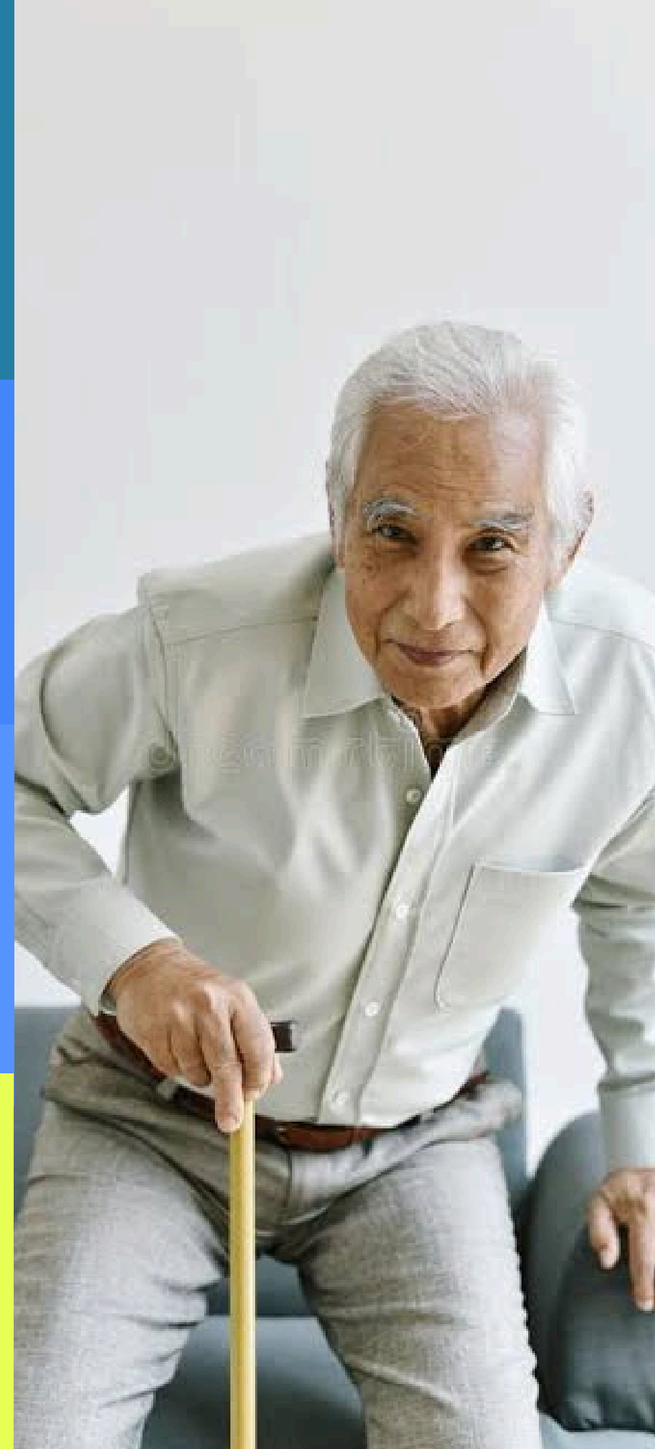
(Colcher & Simuni, 1999)

Bradykinesia (Slowness of movement)

Rest Tremor

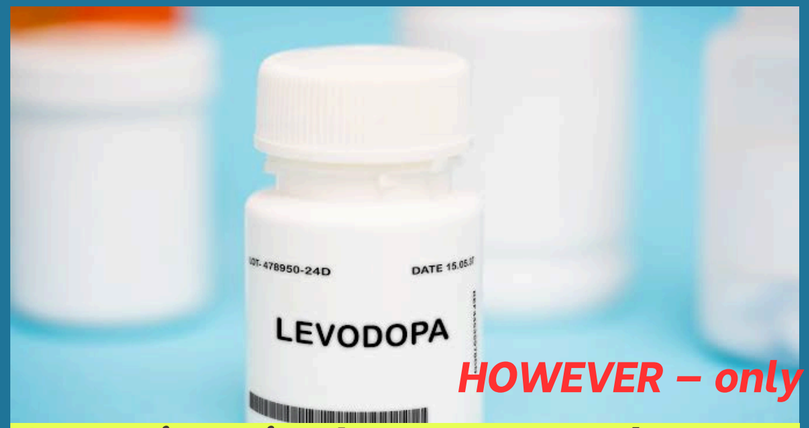
Rigidity

Postural & gait impairment



DIFFERENT TYPES OF TREATMENT

Pharmacological



Dopaminergic Therapy: Levodopa (Most Effective & Common)

- Treat Bradykinesia
- Boost the supply of dopamine
- Associated with motor complications
  e.g. fluctuations and dyskinesias

HOWEVER – only 1.6% potentially eligible for DBS

Surgical



Deep Brain stimulation (most common)

- Address movement symptoms e.g. tremors, wearing-off spells
- Address side effects caused by medication (Levodopa)
  e.g. dyskinesias

(Lee et al., 2018; Morgante et al., 2007; Yuan et al., 2010)

SO....

WHY ARE WE STILL CHOOSING...

Mind Body Exercises?









PHARMACOLOGICAL

SIDE EFFECT OF LEVODOPA

(Cooke et al., 2024; Hurtig, 1997)

Motor Function

- Motor Fluctuations
- Dyskinesia
- Wearing off effect
- Neuronal damage

Ineffectiveness

- Variability of response in different patients
- Inability to control non-motor symptoms (e.g. cognitive decline)
- Progressive loss of independent

Other Consideration

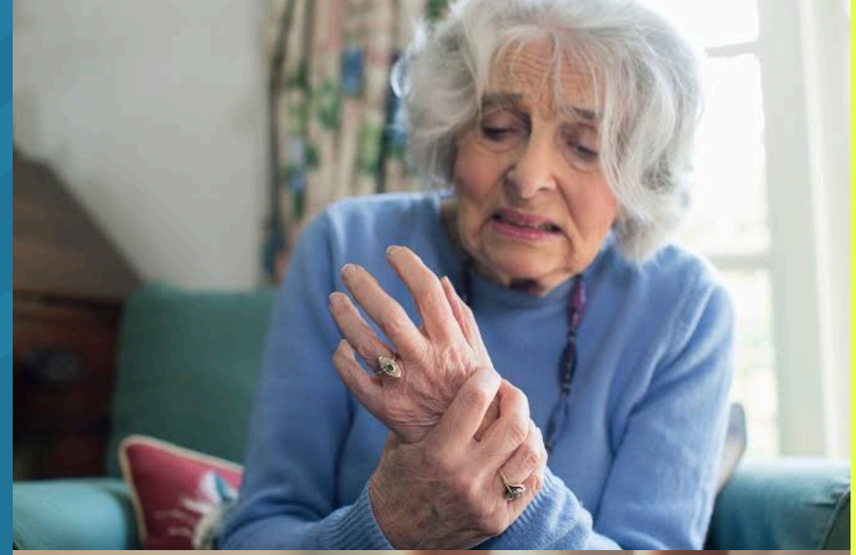
- Dosage **increased over time** to remain effective
- Higher dosages may **raise the risk of side effects**
- Prevalence of motor fluctuations and dyskinesias increased with the duration of PD

SO...

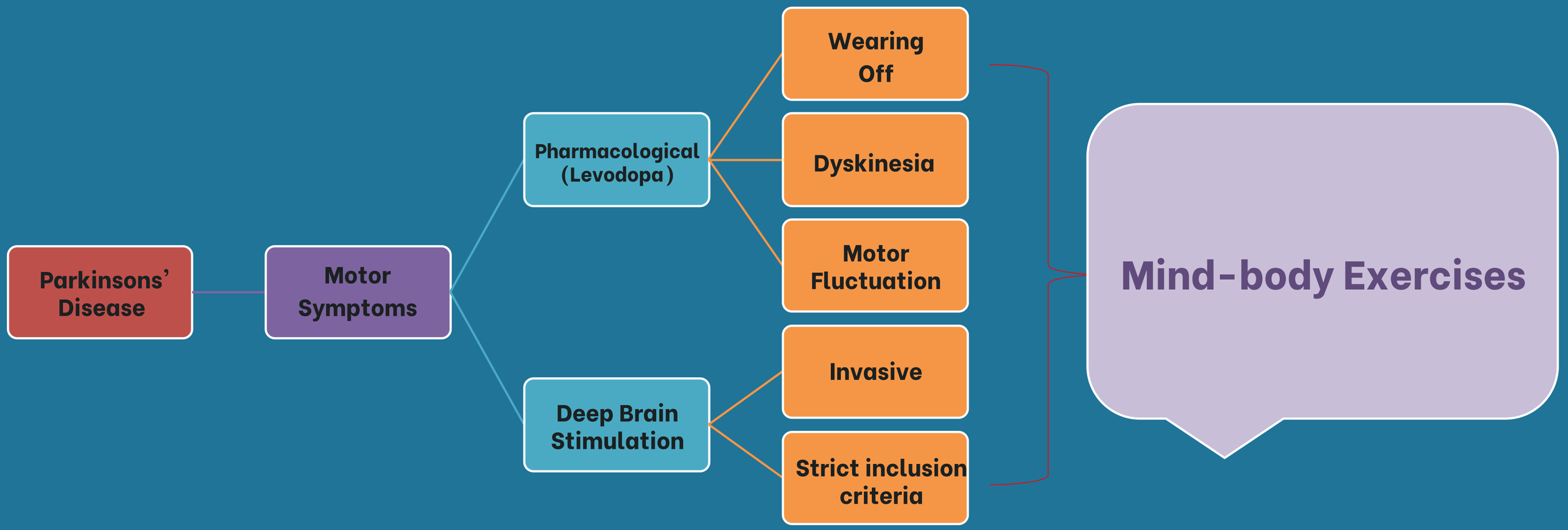
WHAT CAN WE DO TO HELP?

- Tai Chi
- Yoga
- Qigong

Mind Body Exercises






Parkinsons' Disease
Motor Symptoms
Pharmacological (Levodopa)
Deep Brain Stimulation
Wearing Off
Dyskinesia
Motor Fluctuation
Invasive
Strict inclusion criteria
Mind-body Exercises

MIND-BODY EXERCISE

MULTICOMPONENT EXERCISES



Tai Chi:
Tai Chi Chuan (TCC)

- Incorporate physical, cognitive, social and mediative components

Yoga:
Hatha Yoga

- Focus on present movement
- Consist of physical posture, control of breath, use of meditation

Qigong:
Baduanjin (BDJ)

- Slow exercise through coordinated physical movements, breathing, and a meditative state
- Cultivate internal energy – “Qi” = body healing

(Zhang et al., 2021)



METHODS

(ASSESSMENT TOOLS)

HOW TO MEASURE THE EFFECTIVENESS OF MBES?

Gait

- Time up and go test (TUG)
- 10m walking test
- single-task walking (comfortable pace)
- obstacle crossing (15 cm height)

Balance

- Berg Balance Scale (BBS)
- Balance Evaluation Systems Test (BESTest)
- One-legged blind balance test

(Miranda & Tiu, 2023； Negm & Papaioannou, 2022; Pt, 2023)



METHODS

(ASSESSMENT TOOLS)

HOW TO MEASURE THE EFFECTIVENESS OF MBES?

Motor Function

- Movement disorder society-unified Parkinson's disease rating scale (MDS-UPDRS)
- Unified Parkinson's disease rating scale (UPDRS)

Fall Risk

- Number of falls

Physical coordination

- Hand-eye coordination (turn-over-jars) test

(American Physical Therapy Association, n.d.)

INCLUSION & EXCLUSION CRITERIA

Types of evidence sources and information sources

- Include randomised controlled trials, non-randomised control trials, quasi-experimental design studies, cohort studies, pilot studies
- MEDLINE, PubMed, and CINHAL
- All paper must be written entirely in English.
- The reference lists of all included publications were manually searched for other relevant studies electronically.

Types of Participants

- PWP with no other disease affect mobility
- No limitation on: Gender, ethnicity, duration and cognitive function of the participants
- Use Hoehn & Yahr define stage of PD

Types of Intervention

- All types of Taichi, Yoga and Qigong
- No restriction on duration & frequency
- setting must include face to face section
- Exclude any non-real life practice section

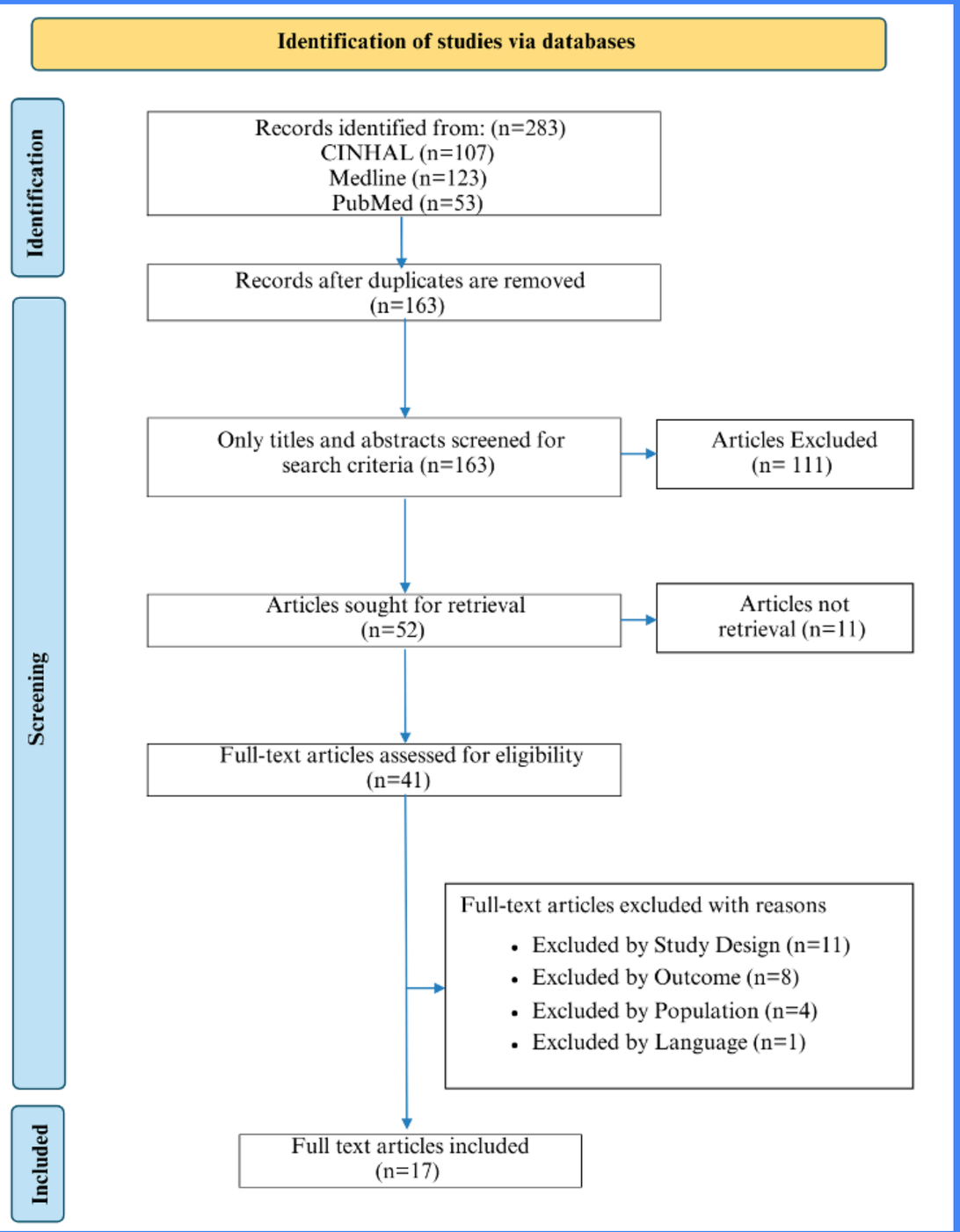
Types of Control

- No intervention
- continue routine care
- active control
- wait list control
- Exclude Co-intervention

SEARCH STRATEGY AND STUDY SELECTION

Table 1 An example of the search strategy

Item	Search terms added with "Parkinson's Disease"		
#1	"Effectiveness" OR "efficiency"		
#2	"Tai Chi" OR "Tahichi" OR "Taiji" OR "Tai chi chuan" OR "Taijiquan"	"Yoga"	"Qigong" OR "Qi Gong"
#3	"Mind body exercises"		
#4	"Balance" OR "mobility" OR "motor function"		
#5	#1 AND #2 AND #4		
#6	#1 AND #3 AND #4		



Searching strategy - use of keywords and rationales

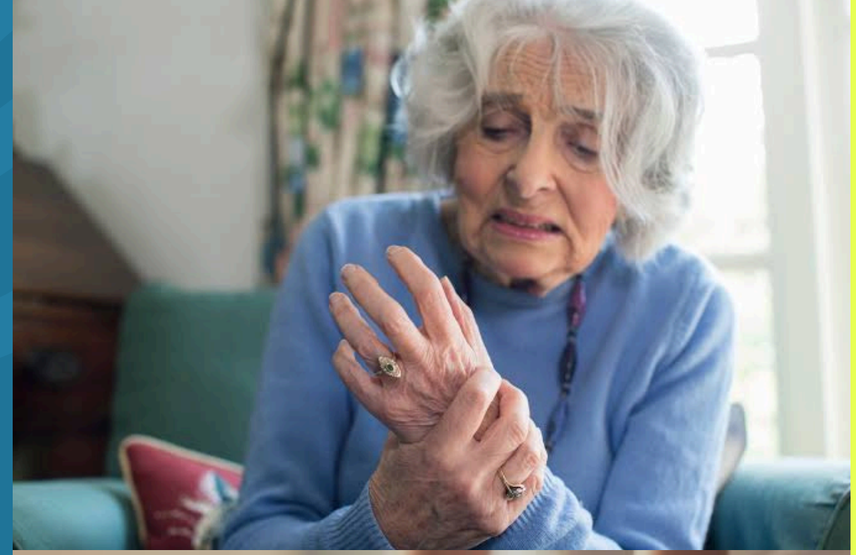
Category	Rationale
Population (P): Patients with: Parkinson's Disease, Idiopathic Parkinson's	The disease and patients we target and include in our study
Intervention (I): Exercise: Tai Chi, Qigong, Yoga, Mind Body Exercises (MBEs),conventional exercise	MBEs for Parkinson's disease patient we want to focus on our study, and other conventional exercises for comparison
Outcome (O): Assessing parameters: Effectiveness, Motor functions, Balance, Mobility	Assessment and evaluation of the effect of MBEs on patients with Parkinson's disease

LET' S SEE...

HOW MBE HELPS

- Tai Chi
- Yoga
- Qigong
- Clinical implication

Mind Body Exercises





Effectiveness of MBE in Parkinson's Disease

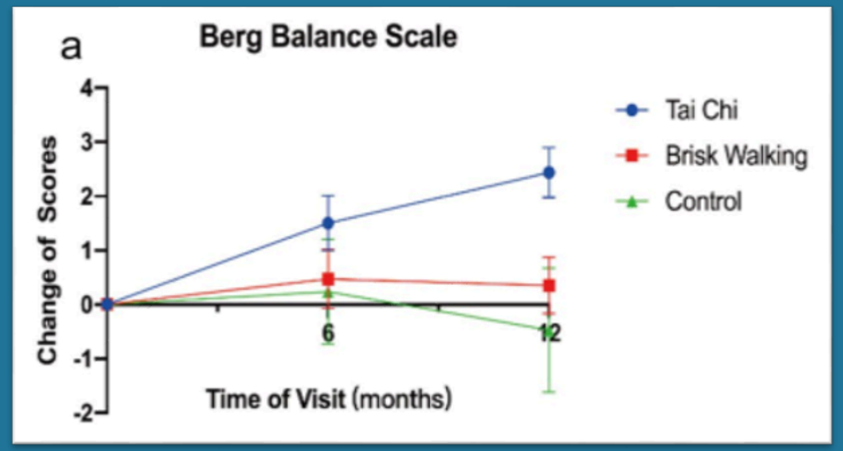
✓ Significant beneficial effects on:

Functional mobility	**Gait speed**	**Postural instability**	**Bone health**
Decreasing depressive symptoms	**Motor symptoms**	**Muscle strength**	**Cardiovascular function**
Balance function	**Health-related quality of life**	**Improving cognitive impairment**	**Enhance memory**

(Cai et al., 2021; Cai et al., 2023;Duan et al., 2020; Kwok et al., 2017; Li et al., 2023b; Shulman et al., 2012; Wu et al., 2021)

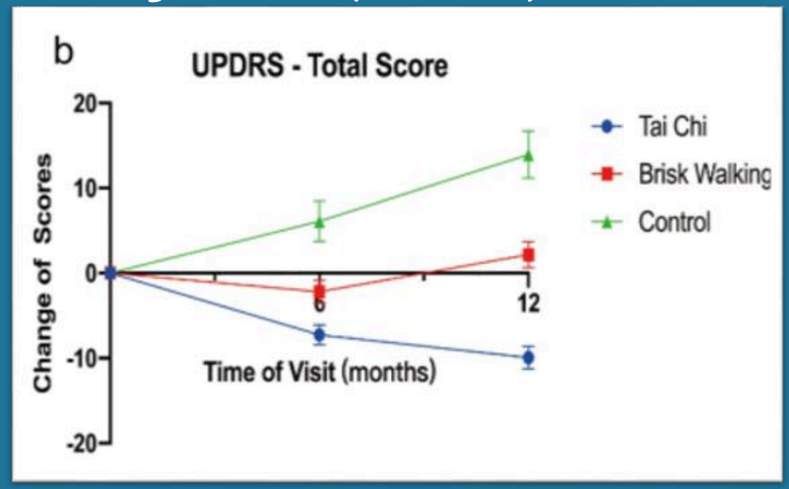
Effectiveness of Tai Chi in Parkinson's Disease

Berg Balance Scale



- The Improved BBS was correlated with enhanced visual network function

Unified Parkinson's Disease Rating Scale (UPDRS)



- Lower scores in UPDRS were associated with enhanced default mode network function an improvement of performance in motor

Enhanced brain network function, energy metabolism and decreased vulnerability to dopaminergic degeneration

(Li et al., 2022a)

Benefits of Tai Chi in Parkinson's Disease

✓ Tai Chi (17 included studies)

⬇ Significant improvements were reported in BBS scores

⬇ Reduces of fall



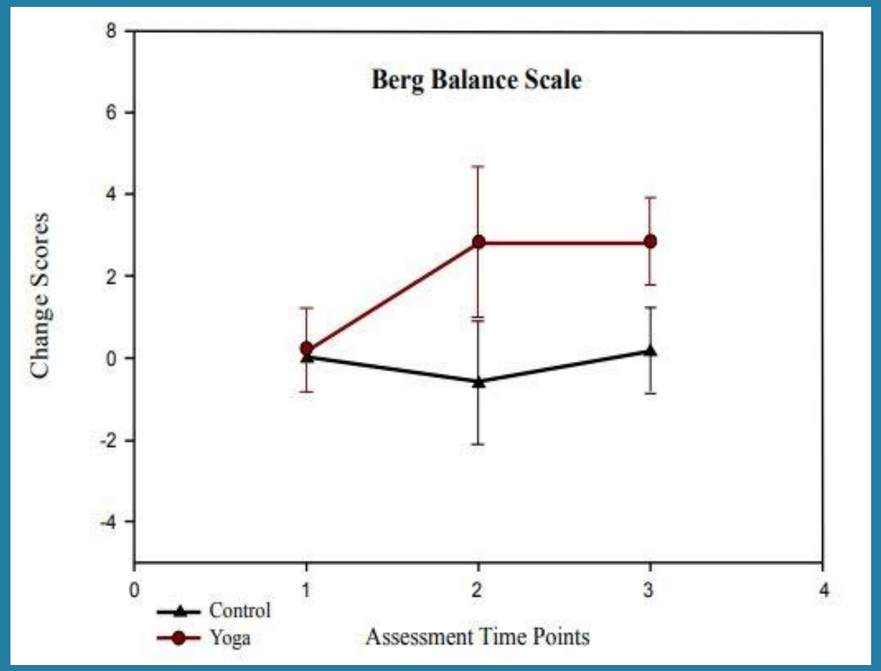
The most consistent intervention for enhancing balance

Long term (6 -12 months):
improve gait metrics such as step width and velocity

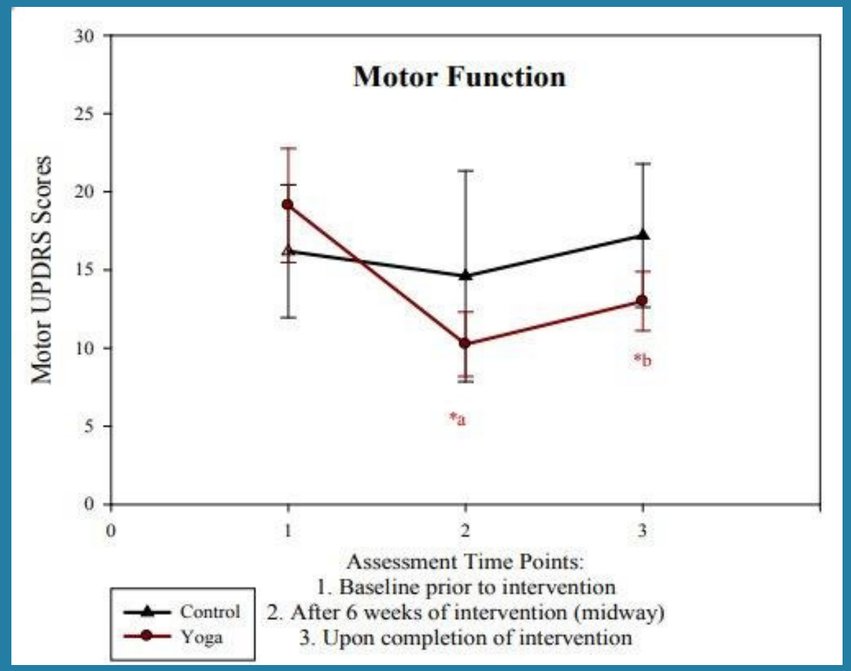
(Amano et al., 2013; Li et al., 2023a)

Effectiveness of Yoga in Parkinson's Disease

Berg Balance Scale



Unified Parkinson's Disease Rating Scale (UPDRS)



Experimental group: 12-week Iyengar Hatha program of yoga intervention Control group: not receiving any intervention

(Colgrove & Sharma, 2012)

Benefits of Yoga in Parkinson's Disease

✓ YOGA

⬆ static balance (Elangovan et al., 2020)

⬆ flexibility (Cherup et al., 2020)

No ***influence on dynamic gait measures***



Benefits on postural stability > locomotion

(Ban et al., 2021; Sharma et al., 2014)

Effectiveness of Qigong in Parkinson's Disease

Time Up and Go Test

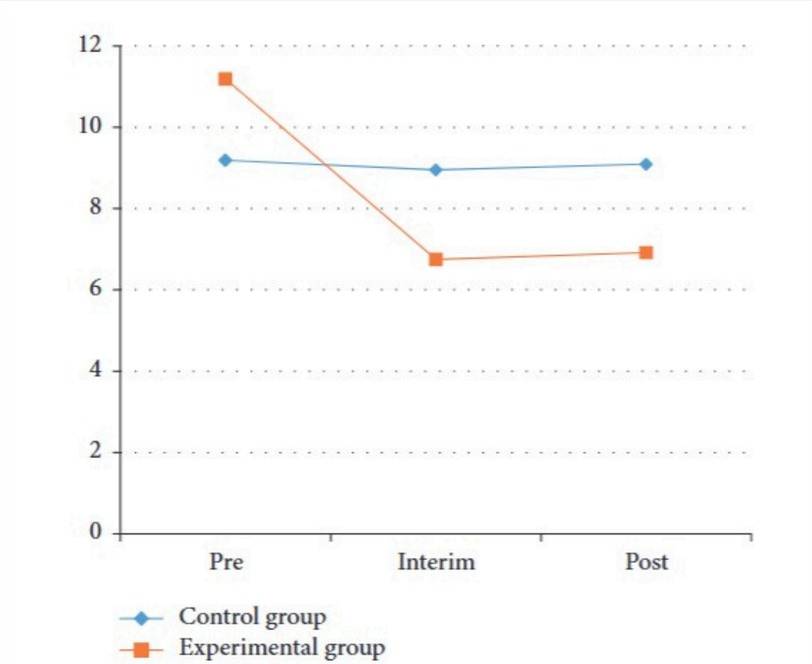


FIGURE 5: The results of right timed "up and go" test between the control and experimental groups.

Experimental group: Qigong Exercise Control group: Regular medication

(Liu et al., 2023)

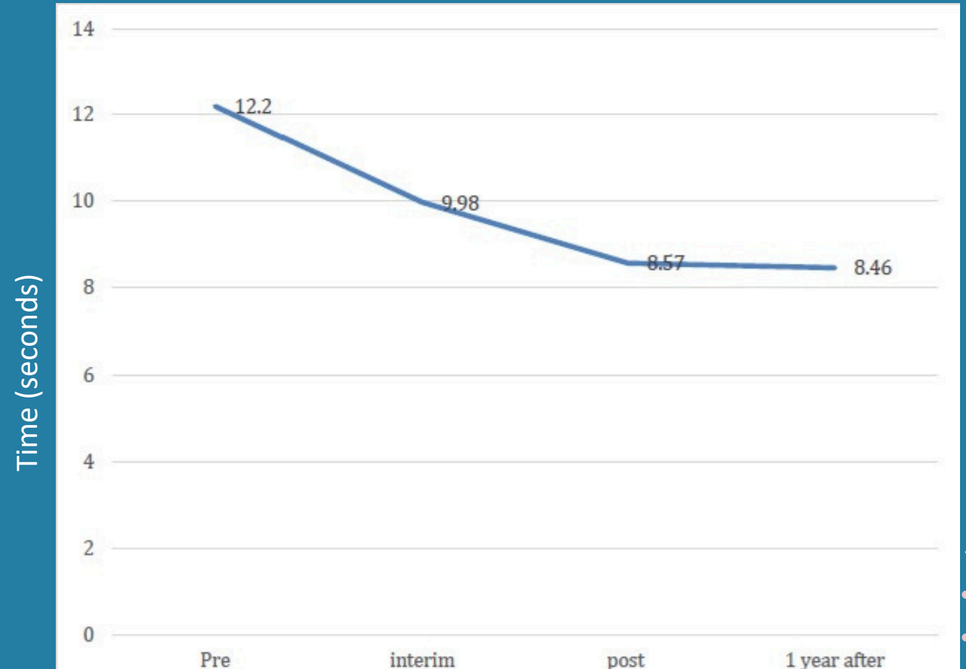


Figure 1 Timed Up and Go results (seconds).

A follow-up study Experimental group: Qigong Exercise

(Liu et al., 2016)

Benefits of Qigong in Parkinson's Disease

✓ QIGONG

⬇ Reduced risk of falls



✓ **long term intervention: enhanced stride length and walking speed**

CLINICAL IMPLICATION

TAILOR-MADE MIND BODY EXERCISES



- Tai Chi
  strong evidence for improving balance, may be prioritised for individuals with postural instability or fall risk.

- Yoga
  may aid people with rigidity or low flexibility

- Qigong
  simplicity and emphasis on flowing motions may appeal to PD patients with moderate mobility problems

CLINICAL IMPLICATION

WHEN ADVISING MBE...



- Evaluate patient's preferences
- physical ability
- past medical history
- stage of PD

Fall prevention
ratio of staff to PD patients was no more than 1:3
(Amano et al., 2013) (Myers et al., 2019)

Alert

- home-based MBEs and program severe stage of PD need to be further modified
- caregiver birden

CONCLUSION

MBEs show significant benefits in PD patient...



- improve balance and mobility
- Approach without side effects
- Enhance overall quality of life of PD patients
- Reduce reliance on pharmacological interventions and enhance patient independence – Lower the chance of medication tolerance

Our scoping review aims to identify which MBE is the most effective and suitable for PD patients to alleviate different symptoms

Further research is needed for the best coordination of conventional and complementary treatment

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Q & A