

Supplementary Material

Effectiveness of Long-Term Physiotherapy in Parkinson's Disease: A Systematic Review and Meta-Analysis

Search Strategy

Pubmed:

("Parkinson Disease"[MH] OR ("Parkinson" AND "disease")[All Fields] OR "parkinson disease"[All Fields] OR "Parkinson's disease"[All Fields] OR "Parkinsonian"[All Fields])

AND

("rehabilitation"[All Fields] OR "physical therapy"[All Fields] OR "physiotherapy"[All Fields] OR "exercise"[MH] OR "training" [All Fields])

AND

("Randomized Controlled Trial"[PT] OR "Controlled Clinical Trial"[PT] OR "clinical trial"[PT] OR random*[TW] OR "randomized controlled trial"[All Fields] OR "random allocation"[All Fields] OR randomized[All Fields] OR randomly OR trial[All fields]) NOT (Animals[MH] NOT Humans[MH])

Cochrane Central Register of Controlled Trials:

MeSH descriptor: [Parkinson Disease] explode all trees OR (("Parkinson" AND "disease") OR "parkinson disease" OR "Parkinson's disease" OR "Parkinsonian")

AND

MeSH descriptor: [Rehabilitation] explode all trees OR MeSH descriptor: [Physical Therapy Modalities] explode all trees OR MeSH descriptor: [Physical Therapy Specialty] explode all trees OR MeSH descriptor: [Exercise] explode all trees OR exercise OR training

AND

Random*

Physiotherapy Evidence (PEDro):

parkinson* AND rehabilitation

AND

parkinson* AND "physical therapy"

AND

parkinson* AND physiotherapy

AND

parkinson* AND exercise

AND

parkinson* AND training

CINAHL:

"Parkinson Disease" OR ("Parkinson" AND "disease") OR "parkinson disease" OR "Parkinson's disease" OR "Parkinsonian"

AND

"rehabilitation" OR "physical therapy" OR "physiotherapy" OR "exercise" OR "training"

AND

"Randomized Controlled Trial" OR "Controlled Clinical Trial" OR "clinical trial" OR random* OR "random allocation"

Supplementary Table 1. Study characteristics

| Study | Subjects, n | Intervention | Outcome Measures | Medication state in evaluation |
|----------------|--|--|---|--------------------------------|
| Corcos 2013 | <u>Ex</u> , 20 (HY 2·3 ± 0·53) <u>Cont</u> , 18 (HY 2·2 ± 0·41) | <u>Ex</u> , Resistance exercise 11 progressive strengthening exercise <u>Cont</u> , Modified fitness count exercise Non progressive stretching, strengthening, and balance exercise Ex and Cont 60-90 minutes per day 2 days per week 24 months | UPDRS motor, LED, Elbow flexor muscle strength and movement speed, Modified Physical Performance Test, PDQ-39 | on/off |
| Ferreira 2018 | <u>Ex</u> , 18 (HY 1-3) <u>Cont</u> , 17 (HY 1-3) | <u>Ex</u> , Resistance exercise 30-40 minutes/session 2 days per week 6 months <u>Cont</u> , No intervention | BAI, UPDRS non-motor, motor, ADL, motor complications, PDQ-39 | on |
| Frazzitta 2012 | <u>Ex</u> , 25 (HY 3) <u>Cont</u> , 25 (HY 3) | <u>Ex</u> , Multidisciplinary rehabilitation mainly consisting of physiotherapy Daily session (two hours of PT and one hour of OT) 4 weeks and maintenance of learned exercise for 1 year PT including cardiovascular warm-up, relaxation exercise, muscle stretching, exercises to improve range of motion, exercises to improve the functionality of abdominal muscles, postural changes in the supine position, and exercises to improve balance and gait using visual or auditory cues. OT to improve autonomy in daily living activities. <u>Cont</u> , Usual care | UPDRS motor, ADL, total, LED | on |
| Frazzitta 2015 | <u>Ex</u> , 20 (HY 1·2 ± 0·3) <u>Cont</u> , 20 (HY 1·1 ± 0·3) | <u>Ex</u> , Multidisciplinary rehabilitation mainly consisting of physiotherapy Daily session (two hours of PT and one hour of OT) 4 weeks at 1 year interval and maintenance of learned exercise for 2 years PT including cardiovascular warm-up, relaxation exercises, muscle stretching, exercises to improve range of motion, postural changes in the supine position, and exercises to improve balance and gait using visual or auditory cues. OT to improve autonomy in daily living activities. <u>Cont</u> , Usual care | UPDRS motor, ADL, 6MWT, TUG, PDDS, LED | off |

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|-------------------|---|--|--|-----|
| Nadeau 2013 | <u>Speed TT</u> , 17 (HY1·5, 2) <u>Mixed TT</u> , 14 (HY1·5, 2) <u>Cont</u> , 14 (HY1·5, 2) | <u>Speed TT</u> , Aerobic exercise using treadmill with incremental speed <u>Mixed TT</u> , Aerobic exercise using treadmill with alternative increase of speed and incline Both groups 1 hour per day 3 days per week 24 weeks <u>Cont</u> , Viactive physical activity program 1 hour per day 2 days per week 24 weeks | Spatiotemporal gait parameters, 6MWT, MDS-UPDRS non-motor, motor, ADL, motor complications, PDQ-39, MMSE, BDI-II, ABC Scale | on |
| Schenkman 2012 | <u>FBF</u> , 39 (HY 1-3) <u>AE</u> , 41(HY 1-3) <u>Cont</u> , 41 (HY1-3) | <u>FBF</u> , Multimodal exercise, Individualized spinal and extremity flexibility exercises followed by group balance/functional training <u>AE</u> , Aerobic exercise by treadmill, bike, or elliptical trainer <u>Cont</u> , Exercise at home using the National Parkinson Foundation Fitness Counts program All groups 5 to 7 days per week 16 months. | CS-PFP, FRT, UPDRS motor, ADL total score, Oxygen uptake, PDQ-39 | on |
| Schenkman 2018 | <u>HIE</u> , 43 (HY 1, 2) <u>MIE</u> , 45 (HY 1, 2) <u>Cont</u> , 40 (HY 1, 2) | <u>HIE</u> , High-intensity aerobic exercise using treadmill (80-85% maximum heart rate) <u>MIE</u> , Moderate-intensity aerobic exercise using treadmill (60-65% maximum heart rate) <u>Cont</u> , Usual care HIE and MIE 4 days per week 26 weeks. | UPDRS motor , UPDRS non-motor, ADL, total, Oxygen uptake, Daily step counts | off |
| Tollar 2019 | <u>AMT</u> , 19 (HY 2, 3) <u>Cont</u> , 20 (HY 2, 3) | <u>AMT</u> , Multimodal exercise, Sensorimotor and visuomotor agility training (gait, coordination, posture, balance, body-scheme) 1 hour per session 15 sessions 3 weeks plus maintenance program Three times per week 2 years <u>Cont</u> , No exercise and no maintenance | MDS-UPDRS ADL, SE ADL, EuroQol, PDQ-39, BDI, TUG, LED, Quantitative assessment of postural instability | on |
| van der Kolk 2018 | <u>Ex</u> , 22 (HY 1-2) <u>Cont</u> , 15 (HY 1-2) | <u>Ex</u> , Aerobic exercise using stationary ergometer 30 min per day 3 days per week | UPDRS motor, TUG, Postural sway test, Pegboard test, Finger tapping, SCOPA | off |

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|----------------------|--|--|--|--------|
| | | 6 months <u>Cont</u> , No intervention | cognition, PDQ-39, HADS, VO _{2max} , TMT | |
| | | <u>Ex</u> , Aerobic exercise using stationary ergometer 30-45 min per day 6 months | MDS-UPDRS motor , IV, VO _{2max} , Falls, 6MWT, TUG, mini-BESTest, Pegboard test, Finger tapping, PDQ-39, HADS, | |
| van der Kolk 2019 | <u>Ex</u> , 65 (HY 1-2) <u>Cont</u> , 65 (HY 1-2) | <u>Cont</u> , Stretching, flexibility, and relaxation 30 min per day 3 days per week 6 months | SCOPA-sleep, Fatigue severity scale, SCOPA autonomic scale, MOCA, TMT, Cognitive domain score, LED | on/off |

N, number, Average \pm standard deviation; Ex, experimental group; Cont, control group; HY, Hoehn and Yahr stage; TT, treadmill training; FBF, flexibility and balance function program; AE, aerobic exercise; HIE, high intensity exercise; MIE, moderate intensity exercise; AMT, agility maintenance training; PT, physical therapy; OT, occupational therapy; MDS-UPDRS, Movement Disorder Society-sponsored revision of the Unified Parkinson's Disease Rating Scale; LED, levodopa equivalent dose; PDQ-39, The Parkinson's disease questionnaire-39; BAI, Beck anxiety inventory; PDDS, Parkinson's disease disability scale; 6MWT, 6 minute walking test state examination; BDI-II, Beck depression inventory II; ABC-scale, activity-specific balance confidence scale; CS-PFP, continuous scale-physical functional performance; FRT, functional reach test; SE ADL, Schwab & England activities of daily living scale; TUG, timed up and go test; SCOPA, scales for outcomes in Parkinson's disease; HADS, Hamilton anxiety and depression Scale; TMT, trail making test; mini-BESTest, mini-balance evaluation system test; MOCA, Montreal cognitive assessment; on, on medication state; off, off medication state.

The bold type in Outcome measures indicates primary outcomes.