Physical exercise improves quality of life, depressive symptoms, and cognition across chronic brain disorders: a transdiagnostic systematic review and meta-analysis of randomized controlled trials

Meenakshi Dauwan*, Marieke JH Begemann, Margot IE Slot, Edwin HM Lee, Philip Scheltens, Iris EC Sommer

*** Corresponding author:**
Meenakshi Dauwan, M.D.
Neuroimaging Center, University Medical Center Groningen
Department of Clinical Neurophysiology and MEG Center, Amsterdam UMC, Vrije Universiteit Amsterdam
Department of Psychiatry, University Medical Center Utrecht
Neuroimaging Center 3111
Antonius Deusinglaan 2
9713 AW Groningen, The Netherlands
Tel: +31 88 75 57468
E-mail: m.dauwan@umcg.nl; m.dauwan-3@umcutrecht.nl

Table S3: Descriptive overview of studies per disorder

Study	Age in years (mean or range)	Gender	Type of patient	Illness duration (mean in years)	Type of control (N)	Type of exercise (N)	Frequency	Study duration	Type of outcome
Alzheimer's disease									
Aguiar 2014	76.7	Both	AD	IG: 2.1 CG: 1.6	AD: rivastigmine (N=18)	Aerobic + strength exercise (N=22)	40min/day, 2x/week	6 months	- Cognition - QoL - ADL - TUG
Arcoverde 2014	78.8	Both	AD	IG: 4.3 CG: 4.1	AD: usual care (N=10)	Treadmill walking (N=10)	30min/day, 2x/week	4 months	- Cognition - BBS - TUG - STS
Cott 2002	82.0	Both	AD	-	- AD: talking (N=30) - AD: usual care (N=26)	Walking (N=30)	30min/day, 5x/wk	16 weeks	- Communication - 2MWT - Functional status
Cox 2015	74.4	Both	AD	-	AD: usual care (N=-)	Home-based physical activity (N=-)	150min/week	6 months	- Physical activity - Balance

									- Leg & grip strength - Mobility
Friedman 1991	-	-	Probable AD	-	AD: conversation (N=-)	Walking (N=-)	30min/day, 3x/week	10 weeks	- Conversation performance
Hoffmann 2015	70.5	Both	Probable AD	-	AD: TAU (N=93)	Aerobic exercise (N=107)	60min/day, 3x/week	16 weeks	- Cognition - HADS - QoL - NPI - ADL
Holthoff 2015[30]	71.5	Both	Mild to moderate AD	-	AD: usual care (N=15)	Physical activity (N=15)	30min/day, 3x/wk, for 12 weeks	24 weeks	- ADL - NPI - Cognition
Kemoun 2010	82.0	Both	AD	-	AD: usual care (N=18)	Walking + exercise (N=20)	60min/day, 3x/wk	15 weeks	- Cognition - Physical function
Kim 2016	81.5	Both	AD	-	AD: MCP (N=14)	Aerobic & flexibility exercise + MCP (N=19)	Exercise: 60min/day, 5x/week MCP: 120min/day, 5x/week	6 months	- Cognition - BBS - Physical function
Lanza 2018	78.5	Both	AD	IG: 2.7 CG: 4.0	AD: physical activity (N=6)	Shiatsu + physical activity (N=6)	- Physical activity: 75/day, 3x/wk - Shiatsu: 40min/wk	10 months	- Cognition - Depression - ADL
Lamb 2018	-	Both	AD, Vascular dementia	-	Dementia: usual care (N=-)	Aerobic and strength exercises (N=-)	60-90min/day, 2x/week + 60min/week at home, for 4 months	12 months	- Cognition - EQ-5D - NPI
Lautenschlager 2015[1]	74.4	Both	AD	-	AD: usual care (N=66)	Home-based physical activity (N=66)	150min/week	6 months	- Cognition - QoL
Maci 2012	72.7	Both	AD	-	AD: usual care (N=7)	Aerobic exercise + cognitive stimulation + socialization (N=7)	- Aerobic exercise: 60min/day, 5x/week - Cognitive stimulation: 60min/day, 5x/week - Socialization: 30min/day, 5x/week	12 weeks	- Cognition - CSDD - QoL - ADL - Anxiety
McCurry 2011	81.0	Both	Probable or possible AD	IG: 4.5 CG (light therapy): 3.0 CG (combination): 3.0 CG (usual care): 4.0	- AD: light therapy (N=34) - AD: usual care (N=33)	- Walking (N=32) - Walking + light therapy (N=33)	3x60min in 8 weeks	6 months	- Sleep parameters
Morris2017[31]	72.9	Both	Probable AD	-	AD: stretching and tonic exercises (N=37)	AD: aerobic exercise (N=39)	60min/wk in week 1, increasing to 150min/wk	26 weeks	- Cognition - Depression - Cardiorespiratory fitness - MRI

Ohman 2016a	78.0	Both	Probable AD	-	AD: usual care (N=70)	- Home-based exercise (N=70) - Group-based exercise (N=70)	60min/day, 2x/week	1 year	- Cognition
Ohman 2016b	77.8	Both	Probable AD	-	AD: usual care (N=65)	Exercise (N=129)	60min/day, 2x/week	1 year	- Fall rate - FIM
Padala 2012	80.5	Both	Mild AD	-	AD: Wii-Fit intervention (N=11)	Walking (N=11)	30min/day, 5x/week	8 weeks	- BBS - TUG - Tinetti test - ADL - QoL - Cognition
Pedrinolla 2018	-	-	AD	-	AD: cognitive training (N=-)	Exercise (N=16)	-	-	- Gait
Perea 2015	-	-	AD	-	AD: stretching (N=14)	Treadmill walking (N=16)	-	26 weeks	- MRI Thalamo-cortical connectivity
Pitkala 2013[2]	78.0	Both	Probable AD	-	- AD: usual care (N=70)	- Home-based exercise (N=70) - Group-based exercise (N=70)	60min/day, 2x/week	1 year	- FIM - Mobility
Roach 2011	88.2	Both	Probable or possible AD	-	AD: social conversation (N=25)	- Walking (N=29) - Strength, balance & endurance exercise (N=28)	30min/day, 5x/wk	16 weeks	- 6MWT - Cognition - ACIF
Rolland 2007	83.0	Both	Probable or possible AD	-	AD: usual care (N=67)	Aerobic + strength exercise (N=67)	60min/day, 2x/wk	12 months	- ADL - 6MWT - One-leg balance - Nutritional status - NPI - Depression
Santana-Sosa 2008	74.5	Both	AD	-	AD: usual care (N=8)	Resistance + coordination exercises (N=8)	75min/day, 3x/week	12 weeks	- ADL - Barthel index - Functional capacity - Tinetti test
Sopina 2017[30]	70.5	Both	AD	-	AD: TAU (N=93)	Aerobic exercise (N=107)	60min/day, 3x/week	16 weeks	- Cost-effectiveness
Steen Jensen 2016[30]	68.7	Both	AD	IG: 1.1 CG: 1.5	AD: TAU (N=27)	Aerobic exercise (N=26)	60min/day, 3x/wk	16 weeks	- CSF amyloid beta and tau
Steen Jensen 2017[30]	68.6	Both	Mild AD	IG: 1.1 CG: 1.7	AD: TAU (N=26)	Aerobic exercise (N=25)	60min/day, 3x/wk	16 weeks	- CSF NFL - CSF Ng - CSF YKL-40

Steinberg 2009	75.3	Both	Probable AD	-	AD: home safety assessment (N=13)	Aerobic, strength + balance exercise (N=14)	-	12 weeks	- CSF VILIP-1 - Cognition - QoL - Depression - NPI - Functional performance
Suttanon 2012	82.0	Both	AD	-	AD: education program (N=21)	Balance + strength home exercise (N=19)	5x/week	6 months	- Cognition - Physical function
Tappen 2000	86.1	Both	Probable AD	-	AD: conversation (N=24)	- Walking (N=26) - Walking + conversation (N=21)	30min/day, 3x/week	16 weeks	- 6MWT
Teri 2003	78.0	Both	Probable or possible AD	IG: 4.0 CG: 5.0	AD: usual care (N=77)	Aerobic, strength, balance exercise (N=76)	30min/day, 2x/week, for 3 months	24 months	- SF-36 - Depression - Physical function
Van der Kleij 2018	68.5	Both	AD	-	AD: usual care (N=24)	Aerobic exercise (N=27)	60min/day, 3x/week	16 weeks	- MRI: cerebral blood flow
Venturelli 2011	84.0	Both	AD	-	AD: usual care (N=12)	Walking (N=12)	30min/day, 4x/week	24 weeks	- Cognition - Barthel index - Physical function - 6MWT
Venturelli 2016	-	-	AD	-	- AD: TAU (N=20) - AD: cognitive training (N=20)	- Aerobic exercise (N=20) - Aerobic exercise + cognitive training (N=20)	60min/day, 5x/wk	12 weeks	- Cortisol levels - NPI - Agitation
Vidoni 2017[31]	72.6	Both	AD	-	AD: stretching and tonic exercises (N=32)	AD: aerobic exercise (N=33)	60min/wk in week 1, increasing to 150min/wk	26 weeks	- Functional disability - Informal caregiving
Vreugdenhil 2012	74.1	Both	AD	IG: 4.2 CG: 3.8	AD: TAU (N=20)	Home-based exercises + walking (N=20)	At least 30min/day	4 months	- Cognition - Physical function - Depression - ADL
Wong 2013	75.9	-	AD	-	AD: stretching exercises (N=7)	Tai Chi Chuan (N=9)	45min/day, 2x/week	12 weeks	- Cognition - CDSS - Balance
Yaguez 2011	73.1	Both	AD	-	AD: usual care (N=12)	Movement exercise (N=15)	90min/wk	6 weeks	- Cognition
Yang 2015	50-80	-	AD	-	AD: health education (N=25)	Cycling (N=25)	40min/day, 3x/week	12 weeks	- Cognition - QoL - Plasma APOE a1 levels - NPI
Zhang 2004	-	-	AD	-	AD: usual care (N=40)	Rehabilitation (N=40)	-	12 months	- SF-36 - Cognition - ADL

Huntington's disease									
Busse 2013	50.4	Both	HD	-	HD: usual care (N=15)	- Gym training - Home walking (N=16)	- Gym: 30min/wk - Walking: 10-30min/day, 2x/wk	24 weeks	- Retention - Adherence - Safety - UHDRS (motor, cognition, functioning, independence) - Gait parameters - SF-36 - 6MWT - Physical activity
Busse 2017	54.9	Both	HD	-	HD: social interaction (N=24)	Physical activity (N=22)	-	14 weeks	- UHDRS (motor and functioning) - Physical activity - 6MWT - TUG - Cognition - EQ-5D
Khalil 2013	52.8	-	Early- to mid-stage HD	-	HD: usual care (N=12)	Home based exercise with DVD + Walking (N=13)	- Home exercise: 3x/wk - Walking: 30min/wk	8 weeks	- Gait - Balance - Functional status - Physical activity - QoL - UHDRS-motor
Quinn 2014	57.0	Both	HD	-	HD: usual care (N=15)	Task specific physical therapy (N=15)	± 60min/day, 2x/week, for 8 weeks	16 weeks	- UHDRS (motor, cognition, functioning) - Adherence - Retention - BBS - TUG - HDQoL - Physical function - 10mWT - 30CST - HADS - EQ-5D
Quinn 2016	52	Both	HD	-	HD: usual care (N=15)	Aerobic + resistance exercise (N=17)	50min/day, 3x/wk	12 weeks	- Safety - Retention - Cognition - Motor function - Physical fitness - EQ-5D

Thompson 2013	53.0	-	Early to middle-stage HD	-	HD: usual care (N=11)	Multidisciplinary rehabilitation program (N=9)	- Group exercise: 60min/wk, 9 months - Home exercise: 3x/wk, for 6 months - Occupational therapy: 1x/2wk, for 6 months	9 months	- UHDRS motor - Cognition - Postural stability/balance - BDI - SF-36 - HDQoL
Multiple Sclerosis									
Afrasiabifar 2018	32.7	Both	MS	-	MS: TAU (N=25)	- Cawthorne-Cooksey balance exercise (N=25) - Frenkel balance exercises (N=25)	60min/day, 3x/wk	12 weeks	- BBS
Aghaie 2010	-	Female	RR-MS	-	MS: wait-list (N=10)	- Aerobic training (N=10) - Resistance training (N=10)	45min/day, 3x/week	8 weeks	- BBS - FSS - 10mWT - 2MWT
Ahmadi 2010a	36.8	Female	MS; EDSS 2.3	IG: 5.6 CG: 5.0	MS: wait-list (N=10)	Treadmill training (N=10)	30min/day, 3x/week	8 weeks	- FSS - MSQOL-54 - BBS - 10mWT - 2MWT
Ahmadi 2010b	34.4	Female	MS; EDSS 2.1	IG: 4.7 CG: 5.0	MS: wait-list (N=10)	Yoga therapy (N=11)	60-70min/day, 3x/week	8 weeks	- FSS - MSQOL-54 - BBS - 10mWT - 2MWT
Ahmadi 2013[13]	35.2	Female	MS; EDSS 2.2	IG (treadmill): 5.6 IG (Yoga): 4.7 CG: 5.0	MS: wait-list (N=10)	- Treadmill training (N=10) - Yoga therapy (N=11)	Treadmill: 50min/day, 3x/week Yoga: 60-70min/day, 3x/week	8 weeks	- BDI - BAI
Amiri 2018	31.6	Female	RR-MS; EDSS 2.5 – 5.5	-	MS: usual care (N=36)	Core stability training (N=36)	60min/day, 3x/wk	10 weeks	- Balance
Arazi 2016	28.5	Female	MS; EDSS1-4		MS: usual care (N=20)	Aerobic + resistance training (N=27)	55min/day, 3x/week	8 weeks	- Balance - Fatigue - 10mWT
Azimzadeh 2015	20-60	Female	RR-MS; EDSS ≤ 5.5	-	MS: usual care (N=18)	Tai Chi (N=18)	45-60min/day, 2x/week	12 weeks	- BBS
Barghi 2018	-	-	Chronic MS	-	MS: complementary and alternative medicine (N=10)	CIMT (N=10)	3,5h/day	10 days	- Motor function - Structural MRI

Barrett 2009	54.4	Both	SP-MS with unilateral dropped foot	IG: 17.7 CG: 13.6	MS: functional peroneal nerve stimulation (N=26)	Physiotherapy home exercises (N=27)	30-60min/day, 7x/week	18 weeks	- 10mWT - 3MWT
Bernhardt 2011	-	Both	MS; EDSS 0-6.5	-	MS: usual care (N=-)	- Gym training (N=-)	-	12 weeks	- Balance - Spasticity - Coordination
Bernhardt 2012	46.3	Both	MS; EDSS 3.2	-	MS: wait-list (N=-)	- PRT (N=-) - Core & stability training (N=-)	60min/week	24 weeks	- BDI - SF-36 - FSMC - MSFC
Bjarnadottir 2007	37.4	Both	RR-MS; EDSS <4	IG: 8.7 CG: 8.3	MS: usual care (N=12)	Exercise (N=11)	60min/day, 3x/week	5 weeks	- SF-36 - Physical fitness - Borg scale
Braendvik 2015	47.9	Both	MS; EDSS <6	IG: 8.3 CG: 6.2	MS: Strength training (N=15)	Treadmill training (N=14)	30min/day, 3x/week	8 weeks	- Balance - Gait
Briken 2014[32]	49.8	Both	Progressive MS; EDSS 5.0	IG (arm): 17.1 IG (rowing): 14.1 IG: (bicycle): 13.3 CG: 18.9	MS: wait-list (N=11)	- Arm ergometry (N=12) - Rowing (N=12) - Bicycle ergometry (N=12)	15-45min/day, 2-3x/wk	10 weeks	- 6MWT - Cognition - Depression - MFIS
Briken 2016[32]	50.2	Both	Progressive MS; EDSS 4.9	IG: 15.5 CG: 18.9	MS: wait-list (N=10)	Endurance exercise (N=32)	15-45min/day, 2-3x/wk	10 weeks	- BDNF - IL-6 - Irisin
Broekmans 2010a	47.8	Both	MS; EDSS 4.3	-	- MS: usual care (N=14)	- Resistance training without electro-stimulation (N=11) - Resistance training with electro-stimulation (N=11)	5x60min per 2 weeks	22 weeks	- Knee strength - TUG - T25FW - 2MWT - FR - RMI
Broekmans 2010b	47.9	Both	MS; EDSS 4.3	-	- MS: usual care (N=14)	WBV exercise program (N=11)	50min per session	22 weeks	- Knee strength - BBS - TUG - T25FW - 2MWT
Bulguroglu 2015	-	-	MS; EDSS <4	-	MS: usual care (N=13)	- Mat pilates (N=12) - Reformer pilates (N=13)	-	-	- BBS - TUG - ABC - FSS - FIS - MSQOL-54
Cakit 2010	38.3	Both	RR-MS/SP-MS; EDSS ≤ 6.0	Resistance: 9.2 Home exercise: 6.2 CG: 6.6	- MS: usual care (N-15)	- Progressive resistance training (N=15)	90-95min/day, 2x/wk	8 weeks	- TUG - DGI - FR

						- Home-based exercises (N-15)			- FES - FSS - 10mWT - BDI - SF-36
Carling 2017	58	Both	MS; EDSS 6.1	IG: 21.6 CG: 20.2	MS: wait-list (N=25)	CoDuSe balance exercises (N=26)	60/min day, 2x/wk for 7 weeks	14 weeks	- TUG - BBS - 2MWT - 10mWT - FSMC - FES
Carter 2014	45.9	Both	MS; EDSS 1.0 – 6.5	IG: 8.4 CG: 9.2	MS: Usual care (N=60)	Pragmatic aerobic exercise therapy (N=60)	60min/day, 3x/wk, for 12 weeks	9 months	- GLTEQ - Daily steps - MSQOL-54 - MSFC - 6MWT
Castro-Sánchez 2012	48.0	Both	MS; EDSS 5.9 – 6.3	IG: 10.7 CG: 11.9	MS: relaxation exercises (N=37)	Ai Chi aquatic exercise program (N=36)	60min/day, 2x/wk, for 20 weeks	30 weeks	- MPQ - RMDQ - Spasm VAS - MSIS-29 - MFIS - FSS - BDI - Barthel index
Catena 2014	-	-	MS	-	MS: aerobic, relaxation + respiratory exercises (N=10)	Pilates (N=10)	60min/day, 2x/week	8 weeks	- FSS - FAMS - Pain
Cattaneo 2007	46.0	Both	RR-MS, PP-MS, SP-MS	13.8 over whole group	MS: conventional therapy (N=15)	- Balance rehabilitation improving motor & sensory strategies (N=23) - Balance rehabilitation improving only motor strategies (N=12)	45min per session, 10-12 sessions over 3 wk	3 weeks	- BBS - DGI - DHI - ABC
Claerbout 2012	43.5	Both	MS; EDSS 5.2	IG (full WBV): 12.1 IG (light WBV): 12.5 CG: 10.3	MS: usual care (N=17)	- Full WBV exercises (N=20) - Light WBV exercises (N=18)	7-13min per session; 10 sessions over 3 weeks	3 weeks	- TUG - BBS - 3MWT - Muscle strength lower limb
Coghe 2018	45.5	Both	RR-MS; EDSS 3.3	-	MS: TAU (N=11)	Aerobic + strength training (N=11)	60min/day, 3x/wk for 24 weeks	48 weeks	- Cognition - MFIS - TUG

Conklyn 2010	48.6	Both	MS	IG: 16.6 CG: 12.2	MS: usual care (N=5)	Home-based walking program (N=5)	20min/day for 2 weeks	6 weeks	- BBS - Gait analysis - Cardiopulmonary test - Gait parameters - T25FW - MAS - Muscle strength - Pain - Ambulation disability - MS related disability - SGI - CGI
Costello 2009	-	Both	MS	-	MS: usual care (N=-)	Home walking program (N=-)	30min/day, 3x/week	12 weeks	- FSS - 6MWT
Dalgas 2009	48.4	Both	RR-MS; EDSS 3.8	IG: 6.6 CG: 8.1	MS: usual care (N=19)	Lower body progressive resistance training (N=19)	2x/week, for 12 weeks	24 weeks	- Muscle strength - 10mWT - 6MWT - CST - SCT
Dalgas 2010a	48.4	Both	RR-MS; EDSS 3.8	IG: 6.6 CG: 8.1	MS: usual care (N=19)	Lower body progressive resistance training (N=19)	2x/week, for 12 weeks	24 weeks	- Muscle fiber size - Thigh volume - Muscle strength
Dalgas 2010b	48.4	Both	RR-MS; EDSS 3.8	IG: 6.6 CG: 8.1	MS: usual care (N=19)	Lower body progressive resistance training (N=19)	2x/week, for 12 weeks	24 weeks	- FSS - MFI - SF-36 - Depression - Leg muscle strength
Dalgas 2013	48.7	Both	RR-MS; EDSS 3.8	IG: 6.6 CG: 8.1	MS: usual care (N=19)	Lower body progressive resistance training (N=19)	2x/week, for 12 weeks	24 weeks	- Muscle strength - EMG
Deckx 2016[14]	48.5	Both	MS; EDSS 3.0	-	MS: usual care (N=25)	Endurance & resistance training (N=38)	5 sessions per 2 weeks	12 weeks	- Inflammatory marker levels
De Bolt 2004	50.7	Both	MS; EDSS 1-6.5	IG: 15.1 CG: 13.1	MS: usual care (N=18)	Resistance training (N=19)	35-50min/day, 3x/week	8 weeks	- Balance - Leg power - TUG
De Oliveira 2016	-	Both	MS	-	MS: wait-list (N=6)	Yoga (N=6)	60min/week	24 weeks	- BBS - EDSS - ADL
Dettmers 2009	42.8	Both	MS; EDSS 2.7	IG: 8.0 CG: 6.1	MS: stretching, balance and coordination training (N=15)	Endurance exercise (N=15)	45min/day, 3x/week, for 3 weeks	4 months	- MFIS - FSMC - BDI - HAQUAMS

Dodd 2011	49.1	Both	RR-MS	-	MS: usual care + social program (N=37)	Lower body progressive resistance training (N=39)	45min/day, 2x/week, for 10 weeks	22 weeks	- Walking distance - 2MWT - Muscle strength - MFIS - WHOQoL-BREF - MSSS-88
Doulatabad 2013	31.6	Female	MS	-	MS: usual care (N=30)	Yoga therapy (N=30)	60-90min/day, 8 sessions per month, for 3 month	4 month	- Pain - QoL
Doulatabad 2014	31.6	Female	MS	-	MS: usual care (N=30)	Yoga therapy (N=30)	60-90min/day, 8 sessions per month	3 months	- Physical activity - Sexual satisfaction
Duff 2018	45.4	Both	MS	-	MS: massage therapy (N=15)	Pilates + massage therapy (N=15)	50min/day, 2x/wk	12 weeks	- 6MWT - TUG - Balance - MSQOL-54
Ebrahimi 2015	38.8	Both	RR-MS; EDSS 3.1	IG: 6.5 CG: 10.5	MS: usual care (N=17)	Low-intensity exercise + whole-body vibration (N=17)	3x/wk	10 weeks	- MFIS - MSQOL-54 - BBS - TUG - 10mWT - 6MWT - FR - Serum ghrelin - Serum leptin - Serum testosterone
Eftekhari 2012	34.4	Female	RR-MS EDSS 2-4	-	MS: usual care (N=12)	Resistance training (N=12)	3x/week	8 weeks	- Strength knee extensors - 10mWT
Eftekharsadat 2015	35.2	Both	RR-MS, SP-MS	IG: 5.8 CG: 8.3	MS: usual care (N=15)	Virtual reality based balance training (N=15)	20min/day, 2x/week	12 weeks	- Muscle test - TUG - MAS - BBS - Fall risk test
Espinosa 2015	-	-	RR-MS; EDSS ≤2.5	-	MS: stretching exercises (N=9)	Qigong exercises (N=9)	60min/day, 3x/week	8 weeks	- Fatigue - Pain - MSQOL-54
Feys 2015	57.3	Both	MS; EDSS 7.2	IG: 21.1 CG: 14.4	MS: usual care (N=9)	Robot-assisted upper limb training (N=9)	30min/day, 3x/week	8 weeks	- Muscle strength - Range of motion - Movement duration - Movement quality
Feys 2016	-	Both	MS	-	MS: waitlist (N=21)	Running training (N=21)	3x/week	12 weeks	- 6MWT - MSWS - Cognition

Fimland 2010	53.5	Both	MS; EDSS 4.1	IG: 8.0 CG: 8.0	MS: conventional rehabilitation (N=7)	Conventional rehabilitation + Maximal strength training (N=7)	5x/week	3 weeks	- FSMC - MSIS-29 - Brain imaging - EMG soleus msucle
Forsberg 2016	54.2	Both	MS	IG: 15.0 CG: 16.0	MS: waitlist (N=38)	CoDuSe balance intervention (N=38)	50-60min/day, 2x/wk	7 weeks	- BBS - TUG - ABC - MSWS-12 - FSS - FGA
Fox 2016	54.1	Both	MS; EDSS 4-6.5	Pilates: 13.2 Exercise: 13.9 CG: 12.1	- MS: relaxation sessions (N=32)	- Pilates (N=33) - Standardized physiotherapy exercises (N=35)	30min/week, for 12 weeks	16 weeks	- 10mWT - FR - MSWS-12 - ABC - Walking velocity
Frevel 2015	45.5	Both	RR-MS; PP-MS; SP-MS; EDSS 3.8	IG: 16.1 CG: 22.3	MS: internet-based balance, postural control & strength exercises (N=9)	Hippotherapy (N=9)	20-30min/day, 2x/week	12 weeks	- BBS - DGI - Muscle strength - TUG - 2MWT - FSS - MFIS - HAQUAMS
Gandolfi 2014	50.5	Both	RR-MS, SP-MS; EDSS 4.2	IG: 13.5 CG: 14.9	MS: sensory integration balance training (N=12)	Robot-assisted gait training (N=14)	50min/day, 2x/week, for 6 weeks	10 weeks	- Gait parameters - BBS - ABC - SOT - FSS - MSQOL-54
Gandolfi 2015	48.4	Both	RR-MS; EDSS 3.3	IG: 12.3 CG: 15.2	MS: sensory integrated balance training (N=39)	Conventional rehabilitation (N=41)	50min/day, 3x/week, for 5 weeks	9 weeks	- BBS - ABC - SOT - MSQOL-54 - FSS - Number of falls
Garrett 2012a	50.1	Both	MS	IG (physio-therapy): 9.8 IG (fitness): 10.5 IG (yoga): 11.6 CG: 10.6	MS: usual care (N=71)	- Physiotherapy (N=80) - Fitness (N=86) - Yoga (N=77)	60min/week, for 10 weeks	12 weeks	- MFIS - 6MWT - MSIS-29

Garrett 2012b[15]	50.1	Both	MS	IG (physio-therapy): 9.8 IG (fitness): 10.5 IG (yoga): 11.6 CG: 10.6	MS: usual care (N=71)	- Physiotherapy (N=80) - Fitness (N=86) - Yoga (N=77)	30min/week, for 10 weeks	24 weeks	- MFIS - 6MWT - MSIS-29
Gervasoni 2014	47.7	Both	MS; EDSS 5.3	IG: 14.5 CG: 15.5	MS: conventional exercise (N=15)	Conventional exercise + treadmill training (N=15)	45min/day, 6x/week	2 weeks	- BBS - FSS - DGI - PANAS - Borg RPE scale
Ghafari 2008	31.5	Both	MS	-	MS: usual care (N=33)	Progressive muscle relaxation training (N=33)	60 sessions	8 weeks	- QoL
Giovannelli 2007	47.3	Both	Progressive MS with spasticity; EDSS 5.9	-	MS: only botulinum injection (N=20)	Physiotherapy after botulimum injection (N=20)	40min/day for 15 days	12 weeks	- MAS
Golzari 2010	33.0	Female	RR-MS	-	MS: usual care (N=10)	Combined endurance & resistance exercises (N=10)	75min/day, 3x/week	8 weeks	- IL-4 - IL-17 - IFN-Y - Balance - Muscle strength
Hasanpour 2016	-	Both	MS	-	MS: usual care (N=30)	- Yoga (N=30) - Aerobic (N=30)	40min/day, 3x/week	12 weeks	- Pain - Fatigue - Psychosocial status
Hayes 2011	49.0	Both	MS; EDSS 5.2	IG: 12.5 CG: 11.9	MS: standard exercises (N=10)	High-intensity resistance training (N=10)	45-60min/day, 3x/week	12 weeks	- Muscle strength - TUG - 10mWT - 6MWT - BBS - FSS
Hebert 2012	46.5	Both	RR-MS; SP-MS	IG: 6.5 CG (exercise): 5.1 CG (usual care): 9.1	MS: usual care (N=13)	- Bicycle endurance & stretching exercises (N=13) - Vestibular rehabilitation program (N=12)	40-55min/day, 2x/week, for 6 weeks	14 week	- MFIS - SOT - 6MWT - DHI - BDI
Heine 2017	45.8	Both	MS; EDSS 3.0	IG: 12.0 CG: 7.0	MS: nurse consultation (N=45)	Aerobic training (N=45)	30min/day, 3x/wk	16 weeks	- Safety - MFIS - FSS
Hoang 2015	52.4	Both	MS; EDSS 4.2	IG: 11.6 CG: 13.4	MS: usual care (N=22)	Home-based step training (N=28)	30min/day, 2x/wk	12 weeks	- CSRT - SST - Postural sway

									- TUG - 10mWT - Cognition - MSFC - 9HPT
Hogan 2014[16]	54.0	Both	MS	IG (group physiotherapy): 18.0 IG (individual physiotherapy): 13.0 IG (yoga): 15.0 CG: 10.0	MS: usual care (N=19)	- Group physiotherapy (N=66) - Individual physiotherapy (N=45) - Yoga (N=16)	60min/wk, for 10 weeks	12 weeks	- BBS - MFIS - MSIS - 6MWT
Hojjatollah 2012	-	Male	MS; EDSS 2-3.5	-	MS: usual care (N=10)	Combined resistance, aerobic and balance exercises (N=10)	60min/day, 3x/wk	8 weeks	- Muscle strength
Jäckel 2015	36.6	Both	RR-MS; EDSS 0-3.5	-	MS: usual care (N=-)	Internet guided endurance + strength training (N=-)	10-60min/day, 2-3x/week	12 weeks	- FSMC - QoL - Depression - Cognition - 2MWT - TUG
Jonsdottir 2014	48.3	Both	MS; EDSS 2.5-5	-	MS: resistance training (N=6)	Treadmill training (N=13)	30min/session, total 20 sessions		- 2MWT - 10mWT - Cognition - Muscle synergies
Kalron 2016a	43.6	Both	RR-MS; EDSS 4.4	IG: 11.3 CG: 12.4	MS: standardized physiotherapy (N=25)	Pilates (N=25)	30min/wk	12 weeks	- TUG - 2MWT - 6MWT - FR - BBS - FSST - MFIS - MSWS-12
Kargarfard 2012	32.6	Female	RR-MS; EDSS 3.0	IG: 4.9 CG: 4.6	MS: usual care (N=16)	Aquatic exercise (N=16)	60min/day, 3x/week	8 weeks	- MFIS - MSQOL-54
Kargarfard 2013[17]	32.6	Female	RR-MS	-	MS: usual care (N=11)	Aquatic exercise (N=10)	45-60min/day, 3x/week	8 weeks	- BBS - 6MWT
Kargarfard 2018[33]	36.4	Female	RR-MS; EDSS 3.6	IG: 6.4 CG: 6.1	MS: usual care (N=15)	Aquatic exercise (N=17)	45-60min/day, 3x/week	8 weeks	- BBS - 6MWT - Sit-to-stand test - MFIS
Kerling 2015	44.0	Both	MS; EDSS 2.9	-	MS: endurance training (N=30)	Endurance + resistance training (N=30)	40min/day, 2x/week	3 months	- MFIS - SF-36

Khan 2008	50.3	Both	MS; EDSS 2-8	IG: 10.7 CG: 9.7	MS: wait-list (N=52)	Rehabilitation (N=49)	30-90min/day, 3-5x/week	12 months	- MSIS - FIM - GHQ-28
Khurana 2012	-	-	RR-MS	-	MS: medication (N=6)	- Physical therapy (N=6) - Virtual exercise (N=6)	60min/day, 3x/week	12 weeks	- 6MWT
Kjolhede 2015	43.2	Both	RR-MS; EDSS 3.0	5.0 over whole group	MS: wait-list (N=17)	Progressive resistance training (N=18)	2x/week, for 24 weeks	48 weeks	- T25FW - 2MWT - 5x Sit-to-stand test - MSWS-12 - Muscle area on MRI - Muscle contractions
Kooshiar 2015	-	Female	MS	-	MS: usual care (N=19)	Aquatic exercise (N=18)	45min/day, 3x/week	8 weeks	- FSS - MFIS - QoL
Kucuk 2016	48.5	Both	MS; EDSS 3,0	IG: 14.8 CG: 14.2	MS: traditional exercises (9)	Pilates (N=11)	45min/day, 2x/week	8 weeks	- MSFC – cognition (PASAT) - QoL - BBS - TUG - BDI - TIS - Physical function
Learmonth 2012	51.6	Both	MS; EDSS 6.0	IG: 13.4 CG: 12.6	MS: usual care (N=12)	Group exercises (endurance, resistance, balance) (N=20)	45-60min/day, 2x/wk	12 weeks	- T25FW - MSFC - BBS - FSS - TUG - Muscle strength lower limb - HADS - QoL - 6MWT - ABC
Learmonth 2017	48.4	Both	MS; EDSS 1.5	IG: 14.8 CG: 13.0	MS: waitlist (N=28)	Home-based resistance and aerobic exercise (N=29)	30min/day, 2x/wk	16 weeks	- Adherence - ABC - MSWS - FSS - HADS - MSIS
Leavitt 2014	-	-	MS	-	MS: stretching exercises (N=-)	Aerobic training (N=-)	30min/day, 3x/week	12 weeks	- fMRI - sMRI - Cognition

Leone 2014	51.2	Both	MS; EDSS 4-6.5	15.6 over whole group	MS: physio-kinesiotherapy (N=27)	Wii balance exercises (N=19)	-	-	- BBS - Barthel index - SF-36 - RMI - T25FW - MSWS-12 - 9-HPT - FIM
Louie 2015	48.6	Both	MS	-	MS: usual care (N=11)	Exercise + education (N=12)	2x/week	6 weeks	- Pain - Fatigue - 10mWT - FR - FSS - MSIS
Majdinasab 2016	30.5	Female	MS; EDSS ≤4.5	IG: 2.9 CG: 3.4	MS: usual care (N=20)	Aquatic exercise (N=20)	60min/day, 3x/week	8 weeks	- FR - LR - TUG
McCullagh 2008	37.0	Both	RR-MS; SP-MS	IG: 5.4 CG: 5.0	MS: usual care (N=13)	Aerobic exercises (N=17)	40-50/day, 3x/week, for 12 weeks	24 weeks	- FAMS - MSIS-29 - MFIS - Borg RPE scale
Medina-Perez 2014	47.9	Both	RR-MS; EDSS 4.3	IG: 11.3 CG: 12.2	MS: usual care (N=12)	Lower limb resistance training (N=30)	2x/week, for 12 weeks	24 weeks	- Muscle strength - Muscle endurance - Muscle contraction
Miller 2011	54.6	Both	MS; EDSS 7.1	IG: 13.0 CG: 18.7	MS: usual care (N=15)	Home-based physiotherapy (N=15)	60min/day, 2x/week, for 8 weeks	16 weeks	- MSIS-29 - QoL - Pain - HADS - Muscle strength - 10mWT - Timed sit-to-stand
Moghadasi 2015	32.4	Female	MS; EDSS 1-5	-	MS: usual care (N=13)	Resistance training (N=14)	3x/week	8 weeks	- BDNF
Moradi 2015	34.1	Male	MS; EDSS 2.9	-	MS: usual care (N=-)	Resistance training (N=-)	3x/week	8 weeks	- Balance - Muscle strength - Mobility
Mori 2011	38.4	Both	RR-MS; EDSS 2-6	-	- MS: only real iTBS (N=10)	- Land & aquatic exercises + sham iTBS (N=10) - Land & aquatic exercises + real iTBS (N=10)	120min/day, 5x/week	2 weeks	- MAS - MSSS-88 - FSS - MSQOL-54 - Barthel index

Negahban 2013	36.6	Both	RR-MS, SP-MS; EDSS 3.7	IG: 8.5 CG (massage): 12.4 CG (massage + exercise): 9.6 CG (usual care): 7.2	- MS: massage therapy (N=12) - MS: usual care (N=12)	- Exercise therapy (N=12) - Exercise + massage (N=12)	30min/day, 3x/week	5 weeks	- Pain - FSS - MAS - BBS - TUG - 10mWT - 2MWT - MSQOL-54
Nilsagard 2013	49.7	Both	MS	IG: 12.5 CG: 12.2	MS: usual care (N=42)	Balance exercises with Nintento Wii (N=42)	30min/day, 2x/wk	8 weeks	- MSIS-29 - TUG - DGI - T25FW - FSST - MSWS-12 - ABC - TCS
O'Donnell 2011	-	-	MS	-	MS: usual care (N=-)	Physiotherapy (N=-)	60min/session, 10 sessions in 2 weeks, followed by 60min/ session, 10 sessions in 10 weeks	12 weeks	- MSIS-29
Oken 2004	49.0	Both	MS; EDSS 3.1		MS: wait-list (N=22)	- Yoga therapy (N=26) - Aerobic exercise (N=21)	90min/week	6 months	- Cognition - Alertness - MFI - Depression - Stress - QoL - T25FW - 9HPT - Chair Sit and Reach
Ortiz-Rubio 2016	43.6	Both	MS; EDSS 5.9	-	MS: information on upper limb training (N=18)	Home-based upper limb training (N=18)	60min/day, 2x/wk	8 weeks	- Arm function - Manual dexterity - Handgrip strength
Ozgen 2016	41.0	Both	MS; EDSS 3.5	-	MS: waitlist (N=20)	Balance exercises + vestibular rehabilitation (N=20)	Rehabilitation: 30-45min/week Home-exercises: 15-20min/day, 2x/week	8 weeks	- Dizziness - ABC - Balance - TUG - 6MWT - DGI - BDI - MSQOL-54 - EDSS

Patti 2002	45.7	Both	PP-MS; SP-MS; EDSS 6.2	IG: 17.2 CG: 17.2	MS: Home exercises (N=53)	Rehabilitation program (N=58)	50-60min/day, 6x/wk, for 6 weeks	12 weeks	- SF-36 - FIS - BDI - FIM - EDSS and functional system of Kurtzke scale - Gait analysis
Patti 2003	45.7	Both	PP-MS; SP-MS	IG: 17.2 CG: 17.2	MS: Home exercises (N=53)	Rehabilitation program (N=58)	6x/wk, for 6 weeks	12 weeks	
Pau 2018	46.0	Both	RR-MS; EDSS 3.5	-	MS: TAU (N=11)	Aerobic + strength training (N=11)	60min/day, 3x/wk	24 weeks	
Paul 2014	51.7	Both	MS; EDSS 5.9	IG: 12.5 CG: 12.8	MS: usual care (N=15)	Web-based physiotherapy (N=15)	2x/week	12 weeks	- TUG - BBS - T25FW - MSIS - QoL - HADS - MS symptoms
Petajan 1996	40.1	Both	MS; EDSS ≤6.0	IG: 9.3 CG: 6.2	MS: usual care (N=25)	Aerobic exercise (N=21)	50min/day, 3x/week	15 weeks	- Muscle strength - Blood lipids - POMS - FSS - Sickness impact
Plow 2014	47.5	Female	RR-MS	IG: 8.0 CG: 10.0	MS: usual care (N=16)	Home-exercise program (N=14)	30-45min/day, 3-5/week	12 weeks	- SF-12 PCS - MSIS - TUG - 6MWT
Prosperini 2013	36.2	Both	MS; EDSS 3.3	IG: 12.2 CG: 9.3	MS: usual care (N=18)	Home-based balance exercise with Wii (N=18)	30min/day, 5x/week, for 12 weeks	24 weeks	- MSIS-29 - T25FW - FSST - Standing balance
Rahnama 2011	33.4	Female	MS	-	MS: usual care (N=15)	Yoga (N=15)	60-75min/day, 3x/week	8 weeks	- Depression
Rampello 2007	41.0	Both	MS; EDSS 3.5	8.0 over whole group	MS: neuro-rehabilitation (N=11)	Aerobic training (N=8)	60min/day, 3x/week, for 8 weeks	24 weeks	- MFIS - MSQOL-54 - 6MWT - Pulmonary function
Razazian 2016	33.9	Female	PP-MS; SP-MS; RR-MS; EDSS ≤6.0	IG (yoga): 6.9 IG (aqua): 7.1 CG: 6.8	MS: usual care (N=18)	- Yoga (N=18) - Aquatic exercise (N=18)	60min/day, 3x/week	8 weeks	- Fatigue - BDI - Paresthesia
Rietberg 2014	46.0	Both	MS; EDSS 3.5	IG: 7.0 CG: 8.0	MS: MS-nurse consultation (N=25)	Multidisciplinary rehabilitation (N=23)	Aerobic training part: 45min/day, 2x/week, for 12 weeks	24 weeks	- Fatigue - MFIS - MSIS-29 - FSS - FIM

Robinson 2015	52.8	Both	MS	-	MS: usual care (N=18)	- Traditional balance exercises (N=18) - Wii balance exercises (N=20)	40-60min/day, 2x/wk	4 weeks	- DIP - IPA - Postural sway - Gait - FSS - MSWS-12 - WHODAS
Romberg 2004	43.9	Both	MS; EDSS 2.3	IG: 6.0 CG: 5.5	MS: usual care (N=50)	Strength & aerobic training (N=49)	Wk 1-3: 10 sessions, wk 4-26: 4-5x/wk	26 weeks	- T25FW - 500mWT - Static balance - Upper limb endurance - Knee flexion/extension
Romberg 2005[18]	43.9	Both	MS; EDSS 2.3	IG: 6.0 CG: 5.5	MS: usual care (N=48)	Long term exercise (mainly resistance) (N=47)	Wk 1-3: 10 sessions, wk 4-26: 4-5x/wk	6 months	- MSFC - T25FW - 9PHT - Cognition - Kurtzke functional system - MSQOL-54 - FIM - CES-D
Ruiz 2013	47.5	Both	MS; EDSS 4.8	IG: 7.4 CG: 13.8	MS: usual care (N=4)	Combined robot-assisted + body-weight supported treadmill training (N=4)	40min/day, 2x/wk, for 2 months	16 weeks	- 6MWT - T25FW - FR
Sabapathy 2011	55.0	Both	MS	10.0 over whole group	MS: resistance training (N=15)	Endurance training (N=6)	2x/wk	8 weeks	- FR - FSST - TUG - 6MWT - MSIS - BDI - SF-36 - MFIS
Salhofer-Polanyi 2013	53.4	Both	MS; EDSS 5.8	IG: 17.6 CG: 15.9	MS: wait-list (N=9)	Multidisciplinary rehabilitation (N=10)	Physiotherapy: 30min/session, 4-5x/day, 5x/week, for 3 weeks	15 weeks	- 2MWT - 6MWT - 50mWT - 9HPT - MSFC - T25FW - BBS - EDSS - Tinetti test - FAMS

								- RMI - MSSE - Cognition
Sandroff 2016	42.9	Female	MS	IG: 11.4 CG: 12.2	MS: wait-list (N=5)	Treadmill walking (N=5)	15-40min/day, 3x/week	12 weeks	- Cognition - 6MWT - Disability
Sandroff 2017a[34]	43.5	Female	RR-MS	-	MS: wait-list (N=3)	Treadmill walking (N=5)	15-40min/day, 3x/week	12 weeks	- Cognition - MRE
Sandroff 2017b	50.5	Both	MS	-	MS: stretching +toning activities (N=40)	Multimodal exercise (N=43)	30-60min/day, 3x/wk	24 weeks	- Cognition - Gait - Physical fitness - T25FW - 6MWT - MSWS-12
Sangelaji 2014	32.6	Both	RR-MS	-	MS: usual care (N=30)	Combined aerobic and strengthening exercises (N=42)	90min/day, 3x/week, for 10 weeks	1 year	- EDSS - Balance - Fatigue - 6MWT - QoL
Solari 1999	44.8	Both	MS; EDSS 5.5	-	MS: home exercises (N=23)	Physical rehabilitation (N=27)	90min/day, for 3 weeks	15 weeks	- FIM - Depression - SF-36
Sosnoff 2014	60.0	Both	MS; EDSS 5.0	IG: 13.9 CG: 17.7	MS: wait-list (N=14)	Home-based exercises (N=13)	45-60min/day, 3x/week	12 weeks	- T25FW - 6MWT - TUG - MSWS-12 - BBS - ABC - PPA
Sosnoff 2015	61.5	Both	MS; EDSS 5.9	IG: 15.0 CG (wait-list): 19.0 CG (education): 14.6 CG (exercise + education): 20.0	- MS: wait-list (N=9) - MS: education program (N=9)	- Home-based exercise program (N=11) - Combined exercise and education (N=8)	3x/week	12 weeks	- PPA - Falls
Storr 2006	51.6	Both	MS; EDSS 6.5	IG: 9.0 CG: 9.0	MS: wait-list (N=65)	Multidisciplinary rehabilitation (N=41)	45min/day, 4-5x/week	5 weeks	- 9PHT - MSIS - 10mWT - QoL - VAS - GNDS
Straudi 2014	52.6	Both	MS; EDSS 4.9	15.2 over whole group	MS: usual care (N=12)	Rehabilitation + home (gait, strengthening +	Rehabilitation: 120min/session, 10	14 weeks	- TUG - 6MWT

						stretching) exercises (N=12)	sessions over 2 weeks Home exercises: 60min/day, 3x/week		- 10mWT - MSIS-29 - DGI - FSS - MSWS-12
Straudi 2015	55.3	Both	RR-MS; PP-MS; SP-MS; EDSS 5.8	IG: 18.6 CG: 17.1	MS: Conventional physiotherapy (N=28)	RAGT (N=30)	60min/day, 2x/week, for 6 weeks	18 weeks	- 6MWT - 10mWT - BBS - TUG - FSS - PHQ-9 - SF-36
Surakka 2004	44.0	Both	MS; EDSS 2.6	IG: 6.0 CG: 5.5	MS: usual care (N=48)	Aerobic + resistance exercises (N=47)	30-35min/day, 4-5/week	26 weeks	- Fatigue - FSS
Sutherland 2001	46.3	Both	MS	IG: 7.0 CG: 6.2	MS: usual care (N=11)	Land and aquatic aerobic exercise (N=11)	45min/day, 3x/week	10 weeks	- MSQOL-54 - Mood (depressed affect)
Tallner 2012	40.8	Both	MS; EDSS 2.8	-	MS: usual care (N=-)	Internet-based endurance + strength training (N=-)	3x/week	12 weeks	- Knee strength - QoL - Fatigue
Tarakci 2013	40.6	Both	MS; EDSS 4.3	IG: 9.0 CG: 8.4	MS: wait-list (N=55)	Group strengthening exercise (N=55)	60min/day, 3x/week	12 weeks	- BBS - 10mWT - FSS - MAS - SCT - MSQOL-54
Van den Berg 2006	30 – 65	Both	MS	-	MS: usual care (N=9)	Treadmill training (N=10)	30min/day, 3x/week, for 4 weeks	12 weeks	- GNDS - FSS - 10mWT - 2MWT
Van Kessel 2008	45.0	Both	MS; EDSS 3.5	IG: 6.7 CG: 5.5	MS: cognitive behavior therapy (N=35)	Muscle relaxation training (N=37)	50min/week, for 8 weeks	6 months	- HADS - Fatigue - Stress - Sleep - Work & social adjustment
Velikonja 2010	41.5	Both	RR-MS; PP-MS; SP-MS; EDSS 4.1	-	MS: yoga (N=10)	Sports climbing (N=10)	1x/wk	10 weeks	- EDSS - MFIS - Cognition - MAS - CES-D
Vermöhlen 2018	50.5	Both	MS; EDSS 5.4	IG: 16.5 CG: 17.6	MS: usual care (N=37)	Hippotherapy (N=30)	1x/wk	12 weeks	- BBS - FSS - Pain

Wens 2015a	45.7	Both	MS; EDSS 2.5	-	MS: usual care (N=11)	- High intensity continuous cardiovascular + resistance training (N=11) - High intensity interval cardiovascular + resistance training (N=12)	5 sessions per 2 weeks	12 weeks	- Spasticity - MSQOL-54 - Muscle fiber proportion - Muscle strength - Physical activity level
Wens 2015b	48.5	Both	MS; EDSS 3.3	-	MS: usual care (N=15)	Endurance & resistance training (N=30)	5 sessions per 2 weeks	24 weeks	- Blood glucose level - Serum insulin level - Knee muscle strength
Wens 2016a[19]	43.0	Both	RR-MS; EDSS 2.6	-	MS: usual care (N=7)	Endurance & resistance training (N=15)	45-75min/session, 5 session per 2 weeks	24 weeks	- Serum BDNF levels - Muscle strength
Wens 2016b[20]	46.0	Both	MS; EDSS 2.5	-	MS: usual care (N=11)	- High-intensity interval training + resistance training (N=12) - High-intensity continuous training + resistance training (N=11)	5 sessions per 2 weeks	24 weeks	- OGTT - Muscle GLUT4 via biopsy
Wiles 2001	47.2	Both	MS	4.4 over whole group	MS: usual care (N= -)	- Home physiotherapy (N= -) - Hospital physiotherapy (N= -)	45min, 2x/wk	8 weeks	- RMI - Barthel index - Balance - 6MWT - 9HPT - HADS - Cognition
Zenginler 2016	44.1	Both	MS; EDSS 4.1	-	MS: usual care (N=-)	Wii balance exercises (N=-)	45min/session, total 16 sessions		- BBS - TUG
Parkinson's disease									
Allen 2010	67.0	Both	Idiopathic PD	IG: 7.0 CG: 9.0	PD: usual care (N=24)	Lower limb strengthening + balance exercises (N=24)	40-60min/day, 3x/week	6 month	- PD falls risk score - BBS - FOG - Physical ability (SPPB) - FES-I - QoL (PDQ-39)
Ashburn 2007	72.2	Both	Idiopathic PD; HY-stage 2-4	IG: 7.7 CG: 9.0	PD: usual care (N=72)	Physiotherapy exercises (N=70)	60min/day, 1x/week by physiotherapist,	6 month	- Self reported falling - FRT

							followed by 60 min daily self-practice, for 6 weeks		- BBS - TUG - Chair stand test - SAS - EQ-5D
Bega 2015	67.3	Both	PD; HY-stage 1-3	-	PD: resistance exercise (N=-)	Yoga (N=-)	-	12 weeks	- PDQ-39 - TUG - MDS-UPDRS III
Belton 2014	68.1	Both	Idiopathic PD; HY-stage 1-4	IG: 6.5 CG: 8.8	PD: usual care (N=12)	Balance exercises (N=12)	60min/week	6 weeks	- TUG - TUG-cognitive - TUG-manual - FES - PDQ-39 - Brief BESTest - MDS-UPDRS
Burini 2006	65.2	Both	PD; HY-stage 2-3	IG: 11.2 CG: 10.6	PD: Qigong (N=13)	Aerobic training (N=13)	45min/day, 3x/week, total 20 sessions in 7 weeks	15 weeks	- MDS-UPDRS III - B'DS - 6MWT - PDQ-39 - BDI
Cakit 2007	71.8	Both	Idiopathic PD; HY-stage>3	5.6 over whole group	PD: usual care (N=27)	Speed-dependent treadmill training (N=27)	30min/week	8 weeks	- BBS - Dynamic Gait Index - FES - Walking speed - Walking distance
Canning 2012	61.8	Both	Idiopathic PD; HY-stage 1-2	IG: 6.1 CG: 5.2	PD: usual care (N=10)	Treadmill walking (N=10)	30-40min/day, 4x/week, for 6 weeks	12 weeks	- 6MWT - PDQ-39 - MDS-UPDRS III - Fatigue - Walking speed
Canning 2014	70.7	Both	Idiopathic PD; HY-stage 2-3	IG: 7.5 CG: 8.3	PD: usual care (N=116)	Lower limb strengthening + balance exercises (N=115)	40-60min/day, 3x/week (1x/month by physical therapist, remaining self-practice)	6 month	- Number of falls - Proportion of fallers - PD falls risk score - Knee extensor muscle strength - Balance test - Physical ability (SPPB) - Walking velocity - STS - FOG - FES-I - Physical activity

Capecci 2014	69.4	Both	Idiopathic PD; HY-stage 2-4	IG: 9.5 CG (PR+KT): 11.0 CG (waitlist): 9.6	PD: waiting list (N=7)	- Postural Rehabilitation (N=7) - PR+ Kinesio taping (N=6)	40min/day, 3x/week, for 4 weeks	2 months	- SF-12v2 - SF-6D - QoL (PDQ-39) - PANAS - BBS - TUG - Axial postural abnormalities
Carroll 2017	71.4	Both	Idiopathic PD; HY-stage 1-3	IG: 7.0 CG: 10.5	PD: usual care (N=10)	Aquatic therapy (N=11)	45min/day, 2x/weeks	6 weeks	- Gait - Freezing - MDS-UPDRS III - PDQ-39
Carvalho 2015	63.7	Both	Idiopathic PD; HY-stage 1-3	-	PD: Strength training (N=8) PD: physiotherapy (N=9)	- Aerobic training (N=5)	30-40min/day, 2x/week, for 12 weeks	12 weeks 2015	- MDS-UPDRS III - MMSE - CST - ACT - 2-MST - CSRT - BST - 8-FT - 10mWT - BBS - EEG mean frequency
Catalan 2013	-	-	PD; HY-stage 3	-	PD: motor imagery (N=7)	Treadmill training (N=7)	-	-	- MDS-UPDRS III - FOG - PDQ-39
Cheng 2016	66.5	Both	PD	IG (balance): 6.5 IG (turning): 6.1 CG: 8.1	PD: trunk exercises (N=12)	- Balance + strength training (N=12) - Turning-based training (N=12)	30min/day, total 12 sessions	4-6 weeks	- FGA - Balance
Choi 2013	63.2	Both	Idiopathic PD; HY-stage 1-2	IG: 5.2 CG: 5.2	PD: usual care (N=9)	Tai chi (N=11)	60min/day, 3x/week	12 weeks	- OLS - 6MWT - Gait - TUG
Cholewa 2013	70.2	Both	Idiopathic PD; HY-stage 3	IG: 8.0 CG: 7.3	PD: usual care (N=30)	Rehabilitation exercises (N=40)	60min/day, 2x/week	12 weeks	- MDS-UPDRS I-III - PDQ-39 - ADL
Clarke 2016	70.0	Both	Idiopathic PD	IG: 4.5 CG: 4.6	PD: usual care (N=381)	Physiotherapy + occupational therapy (N=381)	-	12 weeks	- PDQ-39 - EQ-5D - SF-12 - ADL
Colgrove 2012	68.1	Both	PD; HU-stage 1-2	IG: 3.2	PD: usual care (N=5)	Yoga (N=8)	60min/day, 2x/week	12 weeks	- MDS-UPDRS

				CG: 3.7					- BBS - Muscle strength - Muscle flexibility
Combs 2013	67.3	Both	Idiopathic PD; HY-stage 2	IG: 3.5 CG: 4.2	PD: traditional group exercise (N=14)	Boxing training (N=17)	90min/session, 24-36 sessions	12 weeks	- BBS - ABC - TUG - dTUG - Gait velocity - 6MWT - PDQL
Comelia 1994	66.0	Both	PD; HY-stage 2-3	10.0 over whole group	PD: usual care (N=-)	Physical rehabilitation (N=-)	60min/day, 3x/week, for 4 weeks	6 months	- MDS-UPDRS - GDS
Conradsson 2015	73.3	Both	Idiopathic PD; HY-stage 2-3	IG: 6.0 CG: 5.6	PD: usual care (N=49)	Highly challenging balance training (N=51)	60min/day, 3x/week	10 weeks	- Mini-BESTest - Gait velocity - FES-I - MFE - UPDRS-ADL - Cognitive dual task
Corcos 2013	58.8	Both	Idiopathic PD; HY-stage 2-3	IG: 6.5 CG: 6.5	PD: mFC (N=24)	PRET (N=24)	2x/week	24 months	- Off-medication - MDS-UPDRS-III - Muscle strength - Movement speed - mPPT - PDQ-39
Cugusi 2015	67.3	Both	Idiopathic PD; HY-stage 1-3	IG: 7.0 CG: 7.0	PD: usual care (N=10)	Nordic walking (N=10)	60min/day, 2x/week	12 weeks	- MDS-UPDRS III - 6MWT - FTSTS - BBS - TUG - SRT - PFS-16 - BDI - Apathy - NMSS
Dashtipour 2015	63.4	Both	Idiopathic PD; HY-stage 1-2	IG: 2.9 CG: 4.5	PD: LSVT BIG therapy (N=6)	General exercise (N=5)	60min/day, 4x/week, for 4 weeks	6 months	- MDS-UPDRS III + total - BDI - BAI - MFIS
David 2015[21]	58.8	Both	Idiopathic PD; HY-stage 2	IG: 6.5 CG: 6.5	PD: mFC (N=24)	PRET (N=24)	2x/week	24 months	- Cognition

De Bruin 2015	65.6	Both	PD; HY-stage 2-3	IG: 6.4 CG: 4.5	PD: usual care (N=17)	Walking with music cueing (N=16)	30min/day, 3x/week	13 weeks	- MDS-UPDRS III - Gait parameters
De Oliveira 2016	72.6	Both	Idiopathic PD; HY-stage 1-3	IG (individual): 4.4 IG (group): 4.3 CG: 4.0	PD: usual care (N=8)	- Group exercises (N=8) - Individual exercises (N=8)	60min/day, 2x/week	24 weeks	- Cognition
Di Biagio 2014	-	-	PD	9.9 overall	PD: balance training (N=-)	- Dance therapy (N=-) - Treadmill training (N=-)	Dance: 60min/day, 3x/week Balance & treadmill: 30min/day, 5x/week	4 weeks	- 10MWT - 6MWT - TUG - BBS - FOG
DiFrancisco-Donoghue 2012	68.0	Both	PD; HY-stage 2	IG: 8.0 CG (vit): 9.0 CG (vit + ex): 7.0 CG (usual): 9.0	PD: usual care (N=9) PD: vitamin supplementation (N=10)	- Aerobic + strength exercise (N=10) - Exercise + vitamin supplementation (N=12)	40min/day, 2x/week	6 weeks	- Muscle strength - Blood homocysteine, vit B6, B12, folate levels
Duncan 2012	69.2	Both	Idiopathic PD; HY-stage 2-3	IG: 5.8 CG: 7.0	PD: usual care (N=30)	Argentine Tango dance (N=32)	60min/day, 2x/week	12 months	- MDS-UPDRS I-III - Mini-BESTest - FOG - 6MWT - Gait velocity - Upper extremity function (9HPT)
Duncan 2014	67.8	Both	Idiopathic PD; HY-stage 2-3	IG: 6.6 CG: 11.0	PD: usual care (N=5)	Argentine Tango dance (N=5)	60min/day, 2x/week	2 years	- MDS-UPDRS I-III - Mini-BESTest - Gait velocity - TUG - dTUG - 6MWT - FOG
Ebersbach 2008	73.8	Both	Idiopathic PD; HY-stage	IG: 7.5 CG: 7.0	PD: rehabilitation program + whole body vibration (N=14)	Rehabilitation program + balance training (N=13)	150min/day, 5x/week, for 3 weeks	7 weeks	- Tinetti score - 10mWT - MDS-UPDRS III - Stand-walk-sit test - Postural stability
Ebersbach 2010	67.3	Both	Idiopathic PD; HY-stage 1-3	IG: 6.1 CG (Nordic): 7.8 CG (domestic): 7.4	PD: Nordic walking (N-20) PD: domestic exercises (N=20)	LSVT BIG therapy (N=20)	60min/day, 4x/week, for 4 weeks	16 weeks	- MDS-UPDRS III - TUG - PDQ-39 - 10mWT
Ellis 2005	64.0	Both	Idiopathic PD; HY-stage 2-3	-	PD: medication therapy (N=33)	Rehabilitation program (N=35)	90min/day, 2x/week	6 months	- MDS-UPDRS I-III - CWS - SIP-68

Fisher 2008	62.9	Both	Early-stage PD; HY-stage 1-2	Treadmill: 1.2 Physical therapy: 0.7 CG: 1.5	PD: education classes (N=10)	- Body-weight supported treadmill training (N=10) - Traditional physical therapy (N=10)	Up to 45min/day, 24 sessions	8 weeks	- MDS-UPDRS - Functional assessment walking, and sit-to-stand - Walking test - STS - TMS
Fitton 2015	71.0	Both	Parkinson		PD: usual care (N=15)	Dance (N=36)	60min/day, 2x/week, for 10 weeks	6 months	- Balance - Confidence - Spinal posture - Mobility
Foster 2013	69.2	Both	Idiopathic PD; HY-stage 2-4	IG: 5.8 CG: 7.0	PD: usual care (N=26)	Argentine Tango dance (N=26)	60min/day, 2x/week	12 weeks	- MDS-UPDRS I-III - BDI - ACS
Frazzitta 2012[22]	71.0	Both	Idiopathic PD; HY-stage 3	IG: 8.0 CG: 9.0	PD: usual care (N=25)	Intensive rehabilitation treatment (N=25)	180min/day, 5x/week, for 4 weeks → repeated after 12 months	12 months	- MDS-UPDRS II-III & total
Frazzitta 2014[22]	66	-	Idiopathic PD; HY-stage 1-1.5	IG: 8.0 CG: 8.0	PD: usual care (N=10)	Intensive rehabilitation treatment (N=15)	180min/day, 3x/week, for 4 weeks	4 weeks	- Serum BDNF - MDS-UPDRS III
Frazzitta 2015[22]	68.5	Both	Idiopathic PD; HY-stage 1-1.5	-	PD: usual care (N=20)	Intensive rehabilitation treatment (N=20)	180min/day, 5x/week, for 4 weeks → repeated after 12 months	24 months	- MDS-UPDRS II-III - 6MWT - TUG - PDDS
Ganesan 2014	58.1	Both	PD; HY-stage 2-3	PWSTT: 5.7 Gait: 4.9 CG: 5.5	PD: usual care (N=20)	- PWSTT (N=20) - Conventional gait training (N=20)	30min/day, 4x/week	4 weeks	- Dynamic posturography - BBS - POMA
Ganesan 2015	58.2	Both	PD; HY-stage 2-3	PWSTT: 5.7 Gait: 4.9 CG: 5.5	PD: usual care (N=20)	- PWSTT (N=20) - Conventional gait training (N=20)	30min/day, 4x/week	4 weeks	- MDS-UPDRS - 10mWT - Gait parameters
Gao 2014	68.9	Both	Idiopathic PD; HY-stage 1-4	IG: 9.2 CG: 8.4	PD: usual care (N=40)	Tai Chi (N=40)	60min/day, 3x/week, for 12 weeks	6 months	- MDS-UPDRS III - BBS - TUG - Fall incidence
Gobbi 2013	67.8	Both	Idiopathic PD; HY-stage 1-3	IG (multimodal): 4.3 IG (posture & gait): 6.2 CG: 6.8	PD: cognitive activities (N=15)	- Multimodal exercises (N=15) - Posture & gait exercises (N=15)	60min/day, 2x/week	4 months	- Cognition - LSSI - MDS-UPDRS
Goodwin 2011	71.1	Both	Idiopathic PD; HY-stage 1-4	IG: 9.1 CG: 8.2	PD: usual care (N=66)	Strength & balance training (N=64)	60min/day, 3x/week, for 10 weeks	20 weeks	- Number of falls - FES-I - EQ-5D

Gu 2013	68.5	Both	PD; HY-stage 1-3	IG: 5.8 CG: 6.2	PD: usual care (17)	PD weight bearing exercise for balance (N=18)	40-60min/day, 3x/week	8 weeks	- BBS - TUG - Phone-FITT - FES - Mini-BESTest - MDS-UPDRS
Hackney 2008	67.0	Both	Idiopathic PD; HY-stage 1.5-3	IG: 8.7 CG: 12.0	PD: usual care (N=16)	Tai Chi (N=17)	60min/day, 2x/week, total 20 sessions	13 weeks	- MDS-UPDRS III - BBS - TUG - 6MWT - OLS - Gait parameters
Hackney 2009	67.2	Both	Idiopathic PD; HY-stage 1-3	IG (tango): 6.9 IG (waltz): 9.2 CG: 5.9	PD: usual care (N=20)	- Tango dance (N=18) - Waltz/Foxtrot dance (N=19)	60min/day, 2x/week, total 20 sessions	13 weeks	- MDS-UPDRS III - BBS - TUG - 6MWT - FOG - Gait parameters
Harro 2014a	66.1	Both	Idiopathic PD; HY-stage 1-3	IG: 4.3 CG: 4.0	PD: rhythmic auditory cueing (N=11)	Speed dependent treadmill training (N=11)	30min/day, 3x/week, for 6 weeks	18 weeks	- RST - BBS - SMART EquiTest system for balance - Falls incidence - ABC - PDQ-39
Harro 2014b[23]	66.1	Both	Idiopathic PD; HY-stage 1-3	IG: 4.3 CG: 4.0	PD: rhythmic auditory cueing (N=11)	Speed dependent treadmill training (N=11)	30min/day, 3x/week, for 6 weeks	18 weeks	- 10mWT - 6MWT - FGA
Hass 2012	65.5	Both	Idiopathic PD; HY-stage 1-3	IG: 11.1 CG: 6.4	PD: usual care (N=9)	Progressive resistance training (N=9)	2x/week	10 weeks	- Gait initiation
Hubble 2018	65.4	Both	Idiopathic PD	-	PD: fall prevention education (N=11)	Endurance exercises + fall prevention education (N=11)	90min/week	12 weeks	- Gait - EMG
Kanegusuku 2017	65.0	Both	PD; HY-stage 2-3	IG: 8.5 CG: 9.0	PD: usual care (N=15)	Resistance training (N=15)	2x/week	12 weeks	- Cardiac autonomic modulation - Muscle strength
Keus 2007	-	Both	Idiopathic PD;	-	PD: usual care (N=13)	Physiotherapy (N=14)	1-2x/week	10 weeks	- PDQ-39 - PAS - PPOS
Kurtais 2008	64.8	Both	Idiopathic PD; HY-stage 2-3	IG: 5.3 CG: 5.4	PD: usual care (N=14)	Treadmill gait training (N=13)	40min/day, 3x/week, for 6 weeks	7 weeks	- 20m walking time - Timed U-turn task - Climbing stairs

Laupheimer 2011	69.4	-	PD; HY-stage 2-4	IG: 7.2 CG: 11.0	PD: usual care (N=23)	Cycling (N=21)	40min/day, 5x/week	10 weeks	- Standing up from chair - PDQ-8 - Motor function
Lee 2015	69.3	Both	PD	-	PD: neuro-development + electrical stimulation (N=10)	Virtual reality dance + neuro-development + electrical stimulation (N=10)	30min/day, 5x/week	6 weeks	- BBS - ADL - BDI
Lee 2018	65.7	Both	PD; HY-stage 1-3	IG: 4.5 CG: 4.4	PD: waitlist	Qigong dance training (N=	60min/day, 2x/week	8 weeks	- BBS - BDI - QoL - MDS-UPDRS
Li 2012	68.7	Both	PD: HY-stage 1-4	Tai chi: 8.0 Resistance: 8.0 CG: 6.0	PD: stretching (N=65)	- Tai chi (N=65) - Resistance training (N=65)	60min/day, 2x/week, for 24 weeks	9 months	- Maximum excursion - Directional control - MDS-UPDRS III - TUG - Falls incidence - FRT - Gait parameters - Strength knee
Li 2014	68.7	Both	PD: HY-stage 1-4	Tai chi: 8.0 Resistance: 8.0 CG: 6.0	PD: stretching (N=65)	- Tai chi (N=65) - Resistance training (N=65)	60min/day, 2x/week, for 24 weeks	9 months	- PDQ-8 - VPS - 50-food speed walk test
Liao 2015a[24]	65.7	Both	Idiopathic PD; HY-stage 1-3	IG (traditional exercise): 6.9 IG (Wii program): 7.9 CG: 6.4	PD: no exercise (N=12)	- Traditional exercise + treadmill training (n=12) - Virtual reality Wii fit exercise (N=12)	60min/day, 2x/week, for 6 weeks	16 weeks	- Obstacle crossing parameters - LOS - PDQ-39 - FES-I - TUG - SOT
Liao 2015b[24]	65.7	Both	Idiopathic PD; HY-stage 1-3	IG (traditional exercise): 6.9 IG (Wii program): 7.9 CG: 6.4	PD: fall prevention education (N=12)	- Traditional exercise + treadmill training (N=12) - Virtual reality Wii fit exercise (N=12)	60min/day, 2x/week	6 weeks	- Walking ability - Muscle strength - Sensory integration ability
Liu 2016	64.2	Both	PD	-	PD: medication (N=26)	Qigong (N=	60min/day, 5x/week	10 weeks	- TUG - Physical stability - Muscle hardness
Mak 2008	64.0	-	PD; HY-stage 2-3	IG: 6.1 CG (cued-training): 5.9 CG (usual care): 5.9	PD: usual care (N=18) PD: cued-training (N=21)	Mobility and strengthening exercises (N=21)	45min/day, 2x/week, for 4 weeks	6 weeks	- Motion analysis
McCamish 2013	63.9	Male	PD; HY-stage 1-3	-	PD: stretching exercises (N=4)	Cardiovascular exercise (N=3)	40min/day, 3x/week	12 weeks	- Cognition - PDQ-39

Mezzarobba 2009	75.0	-	PD; Hy-stage 1-3	9 over whole group	PD: neurocognitive rehabilitation with motor imagery (N=11)	Treadmill training (N=10)	20 sessions	12 weeks	- PDQ-39 - TUG - 6MWT - Cognition - FOG - BBS - Disability
Mirabella 2016	-	-	Idiopathic PD	-	PD: emotional training via theater program (N=12)	Physiotherapy (N=12)	-	18 months	- Cognition - Motor symptoms - Well being
Miyai 2002	69.7	Both	PD; HY-stage 2.5-3	IG: 4.1 CG: 4.5	PD: physical therapy (N=12)	Body-weight supported treadmill training (N=12)	45min/day, 3x/week, for 1 month	6 months	- MDS-UPDRS I-IV - Gait parameters
Mollinedo-Cardalda 2017	64.4	Both	PD; HY-stage 2.0	IG: 5.8 CG: 5.7	PD: aerobic exercises (N=10)	Pilates (N=12)	60min/day, 2x/week	12 weeks	- TUG - MDS-UPDRS - Feasibility - Muscle strength
Monticone 2015	73.8	Both	Idiopathic PD; HY-stage 2.5-4	IG: 15.3 CG: 15.7	PD: multidisciplinary rehabilitation (N=35)	Physiotherapy (N=35)	90min/day, for 8 weeks	12 months	- MDS-UPDRS III - BBS - FIM - PDQ-39
Morris 2009	67.0	-	Idiopathic PD; HY-stage 2-3	-	PD: movement strategies training (N=14)	Musculoskeletal exercises (N=14)	45min per session, max 16 session in 2 weeks	14 weeks	- MDS-UPDRS II-III - 10mWT - TUG - 2MWT - Balance pull test - PDQ-39
Morris 2015	67.9	Both	Idiopathic PD; HY-stage 1-4	IG: 7.2 CG (movement training): 6.0 CG (life skills): 6.9	PD: movement strategy training (N=69) PD: life skills discussion (N=71)	Progressive strength training (N=70)	120min/day, 1x/week, for 8 weeks	14 months	- Falls rate - MDS-UPDRS II-III - 6MWT - TUG - PDQ-39 - ED-5D VAS
Morrone 2016	72.5	Both	Idiopathic PD; HY-stage 1-3	IG: 6.5 CG: 6.3	PD: perceptive rehabilitation (N=10)	Conventional physical therapy (N=10)	45min/day, 3x/week	4 weeks	- Gait analysis - Fall risk index
Nadeau 2014	62.8	Both	Idiopathic PD; HY-stage <2	-	PD: light exercises (N=14)	- Speed treadmill training (N=17) - Speed + incline treadmill training (N=14)	60min/day, 3x/week	24 weeks	- Gait parameters - MDS-UPDRS I-IV - Cognition - BDI - PDQ-39 - ABC

Ni 2015	72.6	Both	Idiopathic PD; HY-stage 1-3	IG (PWT): 6.6 IG (Yoga): 6.9 CG: 5.9	PD: health education classes (N=12)	- Power training (PWT; N=14) - Yoga (N=15)	60min/day, 2x/week	12 weeks	- MDS-UPDRS III - BBS - Mini-BESTest - TUG - FRT - SLS - PS - Muscle strength - 10mWT
Ni 2016a[25]	73,1	Both	Idiopathic PD; HY-stage 1-3	IG: 6.9 CG: 5.9	PD: usual care (N=12)	Power yoga (N=15)	60min/day, 2x/week	12 weeks	- Bradykinesia - Rigidity - Muscle strength - PDQ-39
Ni 2016b[25]	73.3	Both	Idiopathic PD; HY-stage 1-3	IG: 6.6 CG: 5.9	PD: usual care (N=12)	Power resistance training (N=14)	2x/week	12 weeks	- Bradykinesia - Muscle strength - PDQ-39
Ortiz-Rubio 2018	-	-	PD	-	PD: TAU (N=-)	Resistance training (N=-)	-	8 weeks	- Balance
Park 2014a	59.9	Both	Idiopathic PD; HY-stage 1-2	IG (communal): 6.2 IG (individual): 5.9 CG: 6.3	PD: no exercise (N=15)	Fitness cycling (N=16)	60min/day, 3x/week, for 24 weeks	48 weeks	- MDS-UPDRS III + total - Tinetti score - PDQ-39 - BDI - Timed walk
Park 2014b	72.5	Both	Idiopathic PD; HY-stage 1-3	-	PD: usual care (N=9)	- Communal strength + balance exercises (N=10) - Individual strength + balance exercises (N=10)	60min/day, 3x/week	10 weeks	- Gait parameters - Fear of falling
Paolucci 2017	66.5	Both	Idiopathic PD; HY-stage 1-3	-	PD: home-based exercise (N=10)	Mezieres rehabilitation (N=10)	60min/day, 5x/week, for 5 weeks	12 weeks	- BBS - Pain - 6MWT - SF_36 - FGA - DGI - MDS-UPDRS
Picelli 2012b	68.3	Both	Idiopathic PD; HY-stage 3-4	7.5 over whole group	PD: robot-assisted gait training (N=17)	Physical therapy (N=17)	40min/day, 3x/week, for 4 weeks	2 months	- BBS - ABC - TUG - 10mWT - MDS-UPDRS III - Nutt's rating scale
Picelli 2015	68.9	Both	Idiopathic PD; HY-stage 3	IG: 8.3 CG: 7.5	PD: robot-assisted gait training (N=33)	Balance training (N=33)	45min/day, 3x/week, for 4 weeks	8 weeks	- BBS - ABC - TUG

Picelli 2016	71.4	Both	Idiopathic PD; HY-stage 3	IG: 11.2 CG: 10.8	PD: lifestyle program (N=8)	Treadmill training (N=9)	45min/day, 3x/week	4 weeks	- MDS-UPDRS III - Cognition - 6MWT - 10MWT - BDI
Pikel 2015	64.5	Both	Idiopathic PD; HY-stage 1-4	-	PD: orientation about fall prevention (N=-)	Physical gait training with mental practice (N=-)	-	14 days	- MDS-UPDRS - TUG - Balance
Poliakoff 2013	65.2	Both	PD	IG: 7.4 CG: 4.7	PD: no exercise (N=16)	Gym training (N=16)	60min/day, 2x/week	10 weeks	- PDQ-39 - MDS-UPDRS III - Timed chair - 6 foot walk
Prodoehl 2015[21]	58.8	Both	Idiopathic PD; HY-stage 2-3	IG: 6.5 CG: 6.5	PD: mFC (N=24)	PRET (N=24)	60-90min/day, 2x/week	24 months	- mPPT - STS - FRT - TUG - BBS - 6MWT - Walking speed
Protas 2005	72.5	Men	Idiopathic PD; HY-stage 2-3	IG: 7.1 CG: 8.1	PD: usual care (N=9)	Gait and step treadmill training (N=9)	60min/day, 3x/week, for 8 weeks	12 weeks	- Gait parameters - Freezing of gait - Fall frequency - Dynamic balance
Qutubuddin 2013	68.2	Both	PD	7.2 over whole group	PD: usual care (N=10)	Cycling (N=13)	30min/day, 2x/week	8 weeks	- BBS - MDS-UPDRS III - PDQ-39 - Fingertapping
Reuter 2011	62.4	Both	PD; HY-stage 2-3	IG (walk): 6.0 IG (Nordic walk): 5.3 CG: 5.2	PD: flexibility + relaxation exercises (N=30)	- Walking (N=30) - Nordic walking (N=30)	70min/day, 3x/week	24 weeks	- Walking speed - MDS-UPDRS - PDQ-39 - Pain
Reuter 2012	64.0	Both	PD; HY-stage 2-4	IG (transfer): 7.9 IG (transfer + motor): 8.3 CG: 8.2	PD: cognitive training (N=71) PD: cognitive + transfer training (N=75)	- Endurance training + cognitive training + transfer & psychomotor training (N=76)	- Cognitive training: 60min/day, 4x/week - Transfer training: 90min/day, 3x/week - Motor training: 60min/day, 3x/week 4 weeks at rehabilitation unit	7 months	- Cognition - PDQ-39 - HDRS

Ridgel 2013	-	-	PD	-	PD: usual care (N=-)	Cycling (N=-)	12 sessions followed by 6 months at home	4 weeks	- MDS-UPDRS III - Balance
Romenets 2015	63.8	Both	Idiopathic PD; HY-stage 1-3	IG: 5.5 CG: 7.7	PD: wait-list (N=15)	Argentine Tango (N=18)	60min/day, 2x/week	12 weeks	- MDS-UPDRS III - Mini-BESTest - TUG - dTUG - FOG - Cognition - BDI - Apathy - PDQ-39 - CGI-C
Sacheli 2012	71.1	Both	PD	-	PD: SAFE (N=9)	- Aerobic exercise + SAFE (N=10) - Resistance exercise + SAFE (N=14)	60min/day, 3x/week	24 weeks	- MDS-UPDRS III - TUG
Sage 2009	65.9	Both	Idiopathic PD	IG: 3.2 CG (sensory attention): 4.7 CG (wait-list): 2.5	PD: wait-list (N=15) PD: SAFE (N=21)	Lower limb aerobic training (N=17)	30min/day, 3x/week	12 weeks	- MDS-UPDRS III - Posture & gait measure - TUG - Gait parameters
Santos 2017a	67.8	Both	Idiopathic PD; HY-stage 1.5-3	IG: 5.6 CG: 5.4	PD: balance training (N=21)	Resistance training (N=19)	60min/day, 2x/week	12 weeks	- Postural balance - BESTest
Santos 2017b	73.6	Both	Akinetic PD; HY-stage 1-2	IG: 10.8 CG: 10.5	PD: usual care (N=15)	Resistance training (N=13)	60-70min/day, 2x/week, for 8 weeks	12 weeks	- MDS-UPDRS - Gait - FOG - PDQ-39
Schenkman 1998	70.9	Both	PD; HY-stage 2-3	-	PD: usual care (N=24)	Exercises to improve spinal flexibility + physical performance (N=27)	45-60min/day, 3x/week	10 weeks	- Range of motion - Spinal flexibility - 6MWT
Schenkman 2012	64.7	Both	Early or mild PD; HY-stage 1-3	IG (Flexibility): 4.9 IG (aerobic): 3.9 CG: 4.5	PD: home exercise (N=41)	- Flexibility/ balance/function exercise (N=39) - Aerobic exercise (N=41)	3x/week, for 4 months, tapered to 1x/month	16 months	- Physical function - FRT - MDS-UPDRS II-III - PDQ-39
Schilling 2010	59.2	Both	PD; HY-stage 1-2.5	-	PD: usual care (N=9)	Lower body resistance training (N=9)	2x/week	8 weeks	- Lower body strength - 6MWT - TUG - ABC

Schlenstedt 2015	75.7	Both	Idiopathic PD; HY-stage 2.5 – 3	-	PD: balance training (N=20)	Resistance training (N=20)	60min/day, 2x/week, for 7 weeks	12 weeks	- FAB - TUG - CGI - MDS-UPDRS III + total - PDQ-39 - BDI - PASE
Schmitz-Hübsch 2006	63.5	Both	PD	IG: 6.0 CG: 5.6	PD: usual care (N=24)	Qigong (N=32)	60min/week	8 weeks	- PDQ-39 - MADRS - MDS-UPDRS III
Sedaghati 2016	58.4	Both	Idiopathic PD; HY-stage 2.6	IG (with pad): 4.9 IG (without pad): 5.2 CG: 4.9	PD: usual care (N=15)	- Balance exercises with balance pad (N=15) - Balance exercises without balance pad (N=15)	60min/day, 3x/week	10 weeks	- Number of falls - FES-I - BBS - TUG
Sharma 2015[26]	68.1	Both	PD; HY-stage 1-2	IG: 3.8 CG: 3.8	PD: usual care (N=5)	Yoga (N=8)	60min/day, 2x/week	12 weeks	- GDS - SF-36 - MDS-UPDRS III - FES
Shen 2012	64.8	Both	PD; HY-stage 2-3	IG: 5.8 CG: 7.1	PD: repetitive step training (N=15)	Lower limb strength training (N=14)	± 60min/day, 3x/week	4 weeks	- Posture and gait - Gait parameters - Fall incidence - LOS
Shen 2014[27]	64.3	Both	Idiopathic PD; HY-stage 2-3	IG: 8.1 CG: 6.6	PD: lower-limb strength training (N=25)	Balance and gait training (N=26)	60min/day, 3x/week, for 8 weeks at laboratory, and 20min/day, 5x/week, for 4 weeks at home	15 months	- ABC - SLS - LOS - Gait parameters
Shen 2015[27]	64.3	Both	Idiopathic PD; HY-stage 2-3	IG: 8.1 CG: 6.6	PD: lower-limb strength training (N=25)	Balance and gait training (N=26)	60min/day, 3x/week, for 8 weeks at laboratory, and 20min/day, 5x/week, for 4 weeks at home	15 months	- Fall rate - Number of fallers - SLS - MCT - Walking test
Shulman 2013	65.8	Both	PD; HY-stage 1-3		PD: stretching & resistance exercises (N=28)	- High-intensity treadmill training (N=26) - Low-intensity treadmill training (N=26)	3x/week, for 3 months	4 months	- 6MWT - 10mWT - Muscle strength - ADL - TUG - MDS-UPDRS III & total - BDI

Silva-Batista 2016	64.2	Both	Idiopathic PD; HY-stage 2-3	IG (RT): 9.6 IG (RTI): 10.5 CG: 10.7	PD: Education + bingo games (N=13)	- Resistance training (RT; N=13) - Resistance training with instability (RTI; N=13)	60min/day, 2x/week	12 weeks	- FES - PDQ-39 - PFS - TUG - Cognition - PDQ-39 - MDS-UPDRS III - Muscle strength
Silva-Batista 2017[35]	64.5	Both	Idiopathic PD; Hy-stage 2.5	IG: 10.0 CG: 11.6	PD: Education + bingo games (N=13)	Resistance training (N=	50min/day, 2x/week	12 weeks	- Sleep quality
Smania 2010	67.5	Both	Idiopathic PD; HY-stage 3-4	IG: 10.4 CG: 8.6	PD: general physical exercises (N=31)	Balance training (N=33)	50min/day, 3x/week, for 7 weeks	11 weeks	- BBS - ABC - Fall incidence - MDS-UPDRS I-IV - GDS - Postural transfers
Sparrow 2016	66.7	Both	Idiopathic PD; HY-stage 2-3	4.3 over entire group	PD: usual care (N=11)	Balance exercises (N=10)	90min/day, 2x/week	12 weeks	- Mini-BESTest - FES-I - Falls
Stack 2012	74.0	Both	PD; HY-stage 1-4	IG: 8.0 CG: 7.0	PD: usual care (N=23)	Physiotherapy (N=24)	60min/day, 3x/week, for 4 weeks	12 weeks	- FRS - HR-QoL - MDS-UPDRS posture - SAS - Sit-to-stand time - Chair transfer score
Stozek 2015	65.5	Both	PD; HY-stage 1.5-3	IG: 4.6 CG: 4.3	PD: usual care (N=31)	Rehabilitation (N=30)	First 2 week: 120min 2x/day, Last 2 week: 120min/day, 3x/week, total 28 sessions	4 weeks	- Balance - Gait - Spinal axial rotation
Taheri 2011	-	-	PD	-	PD: usual care (N=10)	Tension + supple exercises (N=12)	60min/day, 4x/week	10 weeks	- BBS - Tinetti scale - Gait
Tickle-Degnen 2010	66.3	Both	Idiopathic PD; HY-stage 2-3		PD: usual care (N=41)	- 18 hours rehabilitation (N=37) - 27 hours rehabilitation (N=39)	3-4,5hours/week, for 6 weeks	6 months	- PDQ-39
Tramontano 2016	70.0	Both	PD	IG: 8.8 CG: 7.9	PD: blindfolded balance training (N=15)	Physical therapy (N=15)	90min/day, 5x/week	8 weeks	- MDS-UPDRS III - Gait parameters

Vergara-Diaz 2018	63.9	Both	Idiopathic PD; HY-stage 1-2.5	IG: 2.9 CG: 2.9	PD: usual care (N=16)	Tai Chi (N=16)	60min/day, 2xweek + 60min/week at home	6 months	- Safety - Gait - MDS-UPDRS - PDQ-39 - TUG - ABC - Cognition
Wade 2003	70.9	Both	PD	-	PD: no rehabilitation (N=72)	Multidisciplinary rehabilitation (N=72)	2 hours/week, for 6 weeks	24 weeks	- PDQ-39 - SF-36 - EQ-5D - NHPB - HADS - MDS-UPDRS
Wong-Yu 2015a	61.1	Both	PD; HY-stage 2-3	IG: 7.3 CG: 5.4	PD: upper limb training (N=38)	Balance training (N=32)	120min/day, 1x/week, for 8 weeks	8 months	- Mini-BESTest - FRT - FTSTS - TUG - dTUG - OLS
Wong-Yu 2015b[28]	61.0	Both	PD; HY-stage 2-3	IG: 7.1 CG: 5.6	PD: upper limb training (N=43)	Balance training (N=41)	120min/day, 1x/week, for 8 weeks	14 months	- BESTest - Gait speed - dTUG - ABC
Xiao 2015	67.3	Both	Idiopathic PD; HY-stage 1-3	IG: 5.5 CG: 6.2	PD: walking (N=48)	Baduanjin Qigong + walking (N=48)	Qigong: 45min/day, 4x/week Walking: 30min/day	6 months	- Gait - TUG - 6MWT - BBS - MDS- UPDRS III
Yang 2010	67.2	Both	Idiopathic PD; HY-stage 1-3	IG: 4.8 CG: 5.3	PD: conventional therapy (N=17)	Downhill walking (N=16)	30min/day, 3x/week, for 4 weeks	8 weeks	- Gait parameters - Muscle strength
Yen 2011	70.7	Both	Idiopathic PD; HY-stage 2-3	IG: 6.1 CG (virtual reality): 6.0 CG (usual care): 7.8	PD: usual care (N=14)	- Balance training (N=14) - Virtual reality balance training (N=14)	30min/day, 2x/week, for 6 weeks	10 week	- Equilibrium scores
Zhang 2015	65.2	Both	Idiopathic PD; HY-stage 1-4	IG: 6.8 CG: 4.9	PD: multimodal exercises (N=20)	Tai Chi (N=20)	60min/day, 2x/week	12 weeks	- BBS - TUG - Gait parameters - MDS-UPRS III
Schizophrenia									
Battaglia 2013	35.5	Male	Schizophrenia and/or schizoaffective	-	TAU (N=11)	Soccer (N=12)	100-120 min/day, 2x/week	12 weeks	- SF-12 health survey (PCS-12, MCS-12)

			disorder						
Beebe 2005	52.0	Both	Schizophrenia	-	TAU (N=6)	Treadmill walking program (N=6)	30 min/day, 3x/week	16 week	- PANSS
Behere 2011	31.7	Both	Schizophrenia	Yoga: 10.5 Exercise: 7.2 CG: 10.1	Waitlist (N=26)	- Yoga (N=34) - Exercise (N=31)	Not mentioned	- 1 month by yoga instructor - 2 month home practice	- PANSS - SOFS - TRENDS
Bhatia 2017	35.2	Both	Schizophrenia	Yoga: 8.5 Exercise: 8.7 CG: 8.5	TAU (N=92)	- Yoga (N=104) - Physical exercise (N=90)	60min/day, 6x/week, for 21 days	6 months	- Cognition
Duraiswamy 2007	31.9	Both	Schizophrenia	IG: 8.3 CG: 6.8	Physical training (N=30)	Yoga (N=31)	60min/day, 5x/week for 3 weeks by yoga instructor. Thereafter at home for 3 months	4 months	- PANSS - SOFS - WHOQOL-BREF
Falkai 2013	35.0	Male	Schizophrenia	-	Healthy controls: aerobic exercise (N=8) SZ patients: table football (N=8)	Aerobic exercise (N=8)	30min/day, 3x/week	3 months	- MRI of the cortex (gray matter density, cortical surface expansion) - PANSS
Gholipour 2012	40.7	Male	Schizophrenia	At least 3 year history of disease	- TAU (N=15) - Token behavior therapy (N=15)	Exercise (N=15)	120min/day, 3x/week	3 months	- SANS
Ho 2016	54.0	Both	Schizophrenia	Tai chi: 28.5 Exercise: 30.6 CG: 30.7	Waitlist (N=49)	- Tai chi (N=51) - Aerobic exercise (N=51)	1x60min/wk, 2x45min/wk, for 12 weeks	6 mnd	- PANSS - Cognition - Barthel's ADL - Salivary cortisol
Hu 2004	-	-	Schizophrenia	-	TAU (N=58)	Music & sport therapy (N=58)	-	-	- BPRS
Ikai 2013	53.2	Both	Schizophrenia or related psychotic disorder	IG: 24.5 CG: 27.7	Regular day-care program (social skills, psycho-education; N=24)	Yoga (N=25)	60min/week	8 weeks	- PANSS - EQ-5D

Kaltsatou 2014	60.0	Both	Schizophrenia	-	TAU (N=15)	Dancing (N=16)	60min/day, 3x/week	8 months	- GAF - PANSS - QOL enjoyment and satisfaction questionnaire
Kim 2014	49.7	-	Paranoid schizophrenia	>3	TAU (N=15)	Aerobic exercise + strength training (N=25)	60min/day, 3x/week	12 weeks	- BDNF
Kimhy 2015	36.9	Both	Schizophrenia or related disorders	-	TAU (N=17)	Aerobic exercise (N=16)	1h/day, 3x/week	12 weeks	- BDNF - MATRICS cognitive battery
Lin 2015	24.6	Female	Schizophrenia Spectrum Disorder	Yoga: 2.5 Exercise: 2.4 CG: 2.0	Waitlist (N=46)	- Yoga (N=48) - Aerobic exercise (N=46)	60min/day, 3x/wk	12 weeks	- PANSS - SF-36 - Cognition - CDSS - Structural MRI
Lin 2017[36]	24.6	Female	Schizophrenia Spectrum Disorder	-	Waitlist (N=12)	- Yoga (N=23) - Aerobic exercise (N=23)	60min/day, 3x/wk	12 weeks	- Brain functional fluctuation
Loh 2016	21.6	Both	Schizophrenia	-	TAU (N=52	Walking (N=52)	20-40min/day, 3x/wk	12 weeks	- SF-36 - PANSS - PSP
Manjunath 2013	31.4	Both	Schizophrenia	IG: 10 CG: 8.1	Exercise therapy (N=44)	Yoga (N=44)	60min/day, 5x/week	- 2 weeks by yoga instructor - 4 weeks yoga at home	- PANSS - HDRS - CGI-S
Martin 2016	39.3	Both	Schizophrenia Spectrum Disorder	IG: 16.1 CG: 15.6	TAU (N=24)	Movement therapy (N=44)	90min/day, 2x/wk	10 weeks	- SAPS - SANS - BPRS - GAF
Marzolini 2009	44.9	Both	Schizophrenia or schizoaffective disorder	-	TAU (N=6)	Aerobic exercise (N=7)	90min/day, 2x/week	12 weeks	- MHI-18

Oertel Knöchel 2014	39.7	Both	Schizophrenia	Minimum of 5	- Relaxation + cognitive training (N=11) - Waitlist (N=10)	Aerobic + cognitive training (N=8)	75 min (30min cognitive training + 45 min aerobic/relaxation training), 3x/week	4 weeks	- MATRICS cognitive battery - STAI - SF-12 (PSK) - PANSS - RHS
Paikkatt 2012	20-50	Male	Schizophrenia	Minimum of 2	TAU (N=15)	Yoga (N=15)	90min/day, 5x/week	1 month	- GWBM - IDEAS - Basic living skills
Pajonk 2010	33.9	Male	Chronic schizophrenia	10.4	SZ patients: table football (N=11) Healthy controls: aerobic exercise (N=8)	Aerobic exercise (N=11)	30min/day, 3x/week	12 weeks	- Cognition - MRI: hippocampal volume, total brain volume, gray matter volume
Scheewe 2013a[29]	29.4	Both	Schizophrenia, schizoaffective or schizophreniform disorder	6-7.9	Healthy controls: exercise therapy (N=27) or life as usual (N=28) SZ patients: occupational therapy (N=32)	Cardiorespiratory & strength exercises (N=31)	60min/day (40min cardiorespiratory, 20min strength exercise), 2x/week	6 months	- MRI: global brain volume, hippocampal volume, cortical thickness
Scheewe 2013b[29]	29.7	Both	Schizophrenia, schizoaffective or schizophreniform disorder	IG: 6.3 CG: 6.96	Occupational therapy (N=32)	Cardiovascular + strength training (N=31)	60min/day, 2x/week	6 months	- PANSS - MADRS
Svatkova 2015	29.2	Both	Schizophrenia	-	Healthy controls: exercise (N=24), life as usual (N=24) SZ patients: occupational therapy (N=17)	Aerobic & anaerobic exercise (N=16)	60min/day (40min aerobic, 20 min anaerobic exercise), 2x/week	6 month	- MRI (DTI): structural connectivity
Ulloa 2013	15.1	Both	Schizophrenia or schizophreniform disorder		TAU (N=12)	Exercise (N=7)	30min, 9 times		- PANSS - CGI-SCH-S - PSP
Varambally 2012	32.2	Both	Schizophrenia	-	Waitlist (N=36)	- Yoga (N=47) - Exercise (N=37)	- 45min/day, 25 days by yoga instructor - 3 months of yoga	4 months	- PANSS - SOFS

							at home		
Visceglia 2011	42.8	Both	Schizophrenia (some with additional schizoaffective disorder or PTSD)	-	Waitlist (N=8)	Yoga (N=10)	45min/day, 2x/week	8 weeks	- PANSS - WHOQOL-BREF
Zwick 2010	32.1	Both	Paranoid schizophrenia	IG: 6.25 CG: 4.82	Occupational therapy (N=17)	Endurance training (N=20)	30min/day, 4x/week	-	- Cognition
Unipolar Depression									
Babyak 2000[3]	57.0	Both	MDD	-	- MDD: medication (N=48)	- Aerobic exercise (N=53) - Medication + exercise (N=55)	45min/day, 3x/wk, for 16 weeks	10 months	- HDRS - BDI - DIS
Blumenthal 1999	57.0	Both	MDD	-	- MDD: medication (N=48)	- Aerobic exercise (N=53) - Medication + exercise (N=55)	45min/day, 3x/wk	16 weeks	- HDRS - BDI - STAI - RSES - Life satisfaction - Dysfunctional attitude
Blumenthal 2007	52.0	Both	MDD	-	- MDD: sertraline (N=49) - MDD: placebo (N=49)	- Supervised aerobic exercise (N=51) - Home-based aerobic exercise (N=53)	45min/day, 3x/wk	16 weeks	- HDRS - BDI
Brenes 2007	74.6	Both	Minor depression	-	- Depression: sertraline (N=11) - Depression: usual care (N=12)	Aerobic + resistance exercise (N=14)	60min/day, 3x/wk	16 weeks	- HDRS - GDS - SF-36 - Physical functioning
Buschert 2018	47.4	Both	Unipolar depression		- Depression: occupational therapy (N=20)	Physical exercise (N=18)	30min/day, 2-3x/week	3-4 weeks	- Cognition - BDI - HDRS
Carneiro 2015	50.2	Female	Clinical depression	-	Depression: usual pharmacotherapy (N=13)	Aerobic exercise + pharmacotherapy (N=13)	45-50min, 3x/wk	16 weeks	- BDI - DASS-21 - RSES - 6MWT - 30CST
Carneiro 2016[4]	50.2	Female	Clinical depression		Depression: usual pharmacotherapy (N=13)	Aerobic exercise + pharmacotherapy (N=13)	45-50min, 3x/wk	16 weeks	- Blood monoamines levels - Blood cortisol level
Carta 2008[5]	40-60	Female	MDD	-	MDD: pharmaco-therapy (N=20)	Strengthening exercises (N=10)	60min/day, 2x/wk	8 months	- WHOQOL-BREF

Carter 2015	15.4	Both	Depression	-	Depression: TAU (N=43)	Strengthening + aerobic exercises (N=44)	60min,day, 2x/wk, for 6 weeks	6 months	- RPE - CDI-2 - EQ-5D
Cecchini-Estrada 2015	19.6	Both	Depression	-	- Depression: physical activity TARGET strategies program with teacher (N=27) - Depression: physical activity without TARGET strategies program (N=27) - Depression: stretching (N=26)	Aerobic exercise (N=26)	60min/day, 3x/wk	8 weeks	- Depressive symptoms - Motivation
Chan 2011	49.3	Both	Depression	-	Depression: CBT (N=20)	DMBI (N=20)	90min/wk	4 weeks	- BDI - EEG
Chan 2012	46.5	Both	MDD	IG: 9.2 CG (CBT): 7.2 CG (waitlist): 10.4	MDD: CBT (N=17) MDD: waitlist (N=16)	DMBI (N=17)	90min/wk	10 weeks	- HDRS - BDI - Concentration / Attention
Chan 2013[6]	46.5	Both	MDD	-	- MDD: CBT (N=17) - MDD: waitlist (N=16)	DMBI (N=17)	90min/wk	10 weeks	- EEG
Chou 2004	72.6	Both	Major depression or dysthemia	-	Depression: usual care (N=7)	Tai Chi (N=7)	45min/day, 3x/wk	12 weeks	- CES-D
Combs 2014[7]	52.0	Both	MDD	-	- MDD: sertraline (N=49) - MDD: placebo (N=49)	- Supervised aerobic exercise (N=51) - Home-based aerobic exercise (N=53)	45min/day, 3x/wk	16 weeks	- Sleep disturbance
Danielsson 2014	45.5	Both	Major depression	-	- Depression: BBAT (N=20) - Depression: advice on physical activity (N=20)	Aerobic exercise (N=22)	60min/day, 2x/wk	10 weeks	- MADRS - GAF - BAI - Body awareness
Doose 2015	48.7	Both	MDD	IG: 8.1 CG: 10.8	MDD: TAU (N=16)	Aerobic exercise (N=30)	60min/day, 3x/wk	8 weeks	- HDRS - BDI - RPE
Dunn 2005	35.9	Both	Mild to moderate MDD	-	MDD: stretching exercises (N=13)	- Low-dose treadmill training 3x/wk (N=16) - High-dose treadmill training 3x/wk (N=17) - Low-dose treadmill training 5x/wk (N=18) - High-dose treadmill training 5x/wk (N=16)	3-5x/wk	12 weeks	- HDRS

Hoffman 2008[8]	51.7	Both	MDD	-	- MDD: sertraline (N=49) - MDD: placebo (N=49)	- Supervised aerobic exercise (N=51) - Home-based aerobic exercise (N=53)	45min/day, 3x/wk	16 weeks	- Cognition
Hoffman 2011[9]	51.7	Both	MDD	-	- MDD: sertraline (N=49) - MDD: placebo (N=49)	- Supervised aerobic exercise (N=51) - Home-based aerobic exercise (N=53)	45min/day, 3x/wk, for 16 weeks	1 year	- HDRS - MDD status
Huang 2015	76.5	Both	Elderly with depressive symptoms	-	- Depression: CBT (N=18) - Depression: TAU (N=20)	Physical fitness exercise (N=19)	50min/day, 3x/wk, for 12 weeks	9 months	- GDS - 6MWT - SF-36
Hughes 2013	17.0	Both	MDD	-	MDD: stretching exercises (N=14)	Aerobic exercise (N=16)	30-40min/day, 3x/wk, for 12 weeks	52 weeks	- CDI-revised - CGI - C-GAS - QIDS
Kerling 2015	42.6	Both	MDD	-	MDD: TAU (N=20)	Aerobic exercise (N=22)	45min/day, 3x/wk	6 weeks	- MADRS - BDI
Kerling 2017[37]	42.6	Both	MDD	-	MDD: TAU (20)	Aerobic exercise (N=22)	45min/day, 3x/wk	6 weeks	- BDNF
Kerling 2018[37]	41.0	Both	MDD	-	MDD: TAU (10)	Aerobic exercise (N=20)	45min/day, 3x/wk	6 weeks	- Muscle mass
Kerse 2010	81.1	Both	Elderly with depressive symptoms	-	Depression: social visits (N=96)	Home-based physical activity (balance, aerobic, resistance) (N=97)	30min/day, 3x/wk, for 6 months	12 months	- ADL - SF-36 - GDS
Khatri 2001[10]	56.7	Both	MDD	-	- MDD: medication (N=42)	Aerobic exercise (N=42)	45min/day, 3x/wk	16 weeks	- HDRS - BDI - Cognition
Kinser 2013	43.3	Female	MDD	-	MDD: health education (N=12)	Yoga (N=15)	75min/wk	8 weeks	- PHQ-9 - STAI - PSS-10 - RSS
Kinser 2014[11]	43.3	Female	MDD	-	MDD: health education (N=12)	Yoga (N=15)	75min/wk, for 8 weeks	1 year	- PHQ-9 - STAI - PSS-10 - RSS - SF-12
Knubben 2007	49.5	Both	MDD	-	MDD: stretching + relaxation exercises (N=18)	Endurance exercise (N=20)	30min/day	10 days	- BRMS - CES-D

Krogh 2009	38.9	Both	Depression	-	Depression: relaxation exercises (N=55)	- Strength training (N=55) - Aerobic training (N=55)	90min/day, 2x/wk, for 4 months	12 months	- HDRS - Cognition
Krogh 2012	41.6	Both	MDD	-	MDD: stretching exercises (N=59)	Aerobic exercise (N=56)	45min/day, 3x/wk	12 weeks	- HDRS - BDI - Anxiety - Cognition
Lavretsky 2011	70.6	Both	MDD	IG: 3.0 CG: 2.9	MDD: health education (N=37)	Tai Chi (N=36)	120 min/wk	10 weeks	- HDRS - Cognition - CGI - HAS - SF-36 - Apathy - UPDRS - CRP
Legrand 2015	23.0	Female	Depression	-	Depression: waitlist (N=22)	Aerobic exercise (N=22)	60min/day, 2x/wk	7 weeks	- BDI - Self-esteem
Legrand 2016	45.3	Both	MDD	-	- MDD: stretching (N=11) - MDD: TAU (N=10)	Aerobic exercise (N=14)	30min/day	10 days	- BDI
Luttenberger 2015	44.0	Both	Depression	-	Depression: waitlist (N=26)	Bouldering (N=25)	180min/wk	8 weeks	- BDI - SCL-90 - Attention & concentration
Martiny 2015	47.7	Both	MDD	-	MDD: wake therapy (N=37)	Exercise (N=38)	30min/day for 8 weeks	29 weeks	- HDRS - GAF - Sleep
Mather 2002	65.0	Both	Depression	-	Depression: health education (N=43)	Endurance and strengthening exercises (N=43)	45min/day, 2x/wk, for 10 weeks	35 weeks	- HDRS - GDS - CGI
Mota-Pereira 2011	47.0	Both	MDD	-	MDD: pharmacotherapy (N=11)	Home-based walking (N=22)	30-45min/day, 5x/wk	12 weeks	- HDRS - BDI - CGI - GAF
Murri 2015	75.0	Both	MDD	-	- MDD: sertraline (N=42)	- Progressive aerobic exercise (N=42) - Non-progressive exercise (N=37)	60min/day, 3x/week	24 weeks	- HDRS - CGI
Nabkasorn 2006	18.8	Female	Mild to moderate depression	-	Depression: usual care (N=31)	Jogging (N=28)	50min/day, 5x/week	8 weeks	- CES-D - Urine cortisol level - Urine epinephrine level

Niemi 2016	61.3	Both	Moderate depression	-	Depression: TAU (N=22)	Yoga + psycho-education (N=34)	1x/week	8 weeks	- PHQ-9
Oertel Knöchel 2014	40.0	Both	MDD	IG: 10.0 CG (relaxation): 10.1 CG (waitlist): 11.0	- MDD: relaxation + cognitive training (N=6) - MDD: waitlist (N=8)	Aerobic + cognitive training (N=8)	75 min (30min cognitive training + 45 min aerobic/relaxation training), 3x/week	4 weeks	- BDI - STAI - SF-12 - Cognition
Olson 2017	21.1	Both	MDD	-	MDD: stretching (N=21)	Aerobic exercise (N=21)	45min/day, 3x/week	8 weeks	- BDI - Cognition - EEG - Cardiorespiratory fitness
Pfaff 2014	61.0	Both	Major or minor depression		Depression: TAU (N=92)	Home-based aerobic + resistance exercises (N=108)	30min/day, 5x/week, for 12 weeks	52 weeks	- SIGMA - SCID-I
Pilu 2007	40-60	Female	MDD	-	MDD: pharmacotherapy (N=20)	Strengthening exercises (N=10)	60min/day, 2x/week	8 months	- HDRS - CGI - GAF
Prakhinkit 2014	76.6	Both	Mild-to-moderate depression	-	Depression: usual care (N=15)	- Aerobic walking exercise (15) - Buddhism walking meditation (N=15)	20-30min/day, 3x/week	12 weeks	- GDS - IL-6 - Blood cortisol - CRP
Prathikanti 2017	43.4	Both	MDD	-	MDD: education on yoga (N=12)	Yoga (N=18)	90min/day, 2x/week	8 weeks	- BDI - Cognition - Self-efficacy
Schuch 2014	42.7	Both	MDD	-	MDD: TAU (N=11)	Aerobic exercise (N=15)	3x/week	-	- TBARS - Serum BDNF
Schuch 2015	40.3	Both	Severe MDD	-	MDD: TAU (N=25)	Aerobic exercise (N=25)	3x/week	-	- HDRS - WHOQOL BREF
Shahidi 2011	66.5	Female	Depression	-	- Depression: usual care (N=24)	- Aerobic exercise (N=23) - Laughter yoga (N=23)	30min/session, total 10 session	-	- GDS - Life satisfaction
Sharma 2017	37.1	Both	MDD	-	MDD: waitlist (N=12)	Yoga (N=13)	Week 1: 3.5h/day, week 2-8: 90min/week + 20-25/day at home	8 weeks	- HDRS - BDI - BAI - Suicidal ideation
Sims 2006	74.3	Both	Depression	-	Depression: advice (N=18)	PRT (N=14)	3x/week	10 weeks	- GDS - CES-D - HAP - PGMS - WHOQOL-BREF

Singh 1997a	71.0	Both	Unipolar major or minor depression or dysthemia	IG: 2.0 CG: 2.7	Depression: Health education (N=13)	PRT (N=15)	60min/day, 3x/wk	10 weeks	- Sleep
Singh 1997b	71.0	Both	Unipolar major or minor depression or dysthemia	IG: 2.0 CG: 3.0	Depression: Health education (N=15)	PRT (N=17)	50min/day, 3x/wk	10 weeks	- BDI - GDS - PGMS - HDRS - SF-36 - IADL
Singh 2001[12]	71.0	Both	Unipolar major or minor depression or dysthemia	-	Depression: Health education (N=14)	PRT (N=15)	45min/day, 3x/wk, for 10 weeks	26 months	- BDI - PGMS
Singh 2005	69.3	Both	Unipolar major or minor depression or dysthemia	-	Depression: usual care (N=20)	- High-intensity PRT (N=20) - Low-intensity PRT (N=20)	60min/day, 3x/wk	8 weeks	- GDS - HDRS - SF-36 - PSQI
Siqueira 2016	38.8	Both	MDD	-	MDD: usual care (N=28)	Aerobic exercise (N=29)	4x/week	4 weeks	- HDRS - BDI
Tolahunase 2018	-	-	MDD	-	MDD: TAU (N=-)	Yoga (N=-)	-	12 weeks	- BDI - BDNF
Tsang 2006	82.4	Both	Depression	-	Depression: newspaper reading group (N=34)	Qigong exercise (N=48)	30-45min/day, 3x/week, for 16 weeks	24 weeks	- GDS - Self-efficacy - GHQ-12 - PWI
Tsang 2012	80.2	Both	MDD	-	MDD: newspaper reading group (N=17)	Qigong exercise (N=21)	45min/day, 3x/week, for 12 weeks	20 weeks	- GDS - HDRS - Self-efficacy - Muscle strength - Blood serotonin level - Salivary cortisol
Veale 1992	35.5	Both	Depression	-	Depression: usual care (N=35)	Aerobic exercise (N=48)	3x/week	12 weeks	- BDI - Anxiety - CIS
Yeung 2012	55.0	Both	MDD	-	MDD: waitlist (N=13)	Tai Chi (N=26)	60min/day, 2x/week	12 weeks	- HDRS - CGI - QoL
Yeung 2017	54.0	Both	MDD	-	MDD: education (N=22) MDD: waitlist (N=22)	Tai Chi (N=23)	60min/day, 2x/week, for 12 weeks	24 weeks	- HDRS - SF-36 - CGI - Mindfullness

-: not available; [1] Same study as Cox 2015, but with different outcome measures reported; [2] Same study as Ohman 2016, but with results on physical function and mobility; [3] 10-month follow-up results of Blumenthal 1999; [4] Same study as Carneiro 2015 with results on blood monoamines levels; [5] Same study as Pilu 2007, but with results of QoL; [6] Same study as Chan 2012 with EEG results; [7] Same study as Blumenthal 2007 with results on sleep; [8] Same study as Blumenthal 2007 with results on cognition; [9] 1-year follow-up results of Blumenthal 2007; [10] Same study as Blumenthal 1999 with results on cognition; [11] 1-year follow-up results of Kinser 2013 and with also reporting 8-weeks outcome on PHQ-39; [12] Phase II results of Singh 1997b; [13] Same study as Ahmadi 2010a and 2010b, but with results on BDI and BAI; [14] Same study as Wens 2015b with results on inflammatory markers; [15] Follow-up study of Garrett 2012a; [16] Same study as Garrett 2012a, and Garrett 2012b, but with different MS patients; [17] Same study as Kargarfard 2012, but with different outcome measures reported; [18] Same study as Romberg 2004, but with different outcome measures reported; [19] Same study as Wens 2015b with result son serum BDNF levels; [20] Same study as Wens 2015a with results on glucose tolerance; [21] Same study as Corcos 2013, but with different outcome measures reported; [22] Same studies, but with results reported at different follow-up periods; [23] Same study as Harro 2014a, but with different outcome measures; [24] Same studies with different outcome measures reported in the two papers; [25] Secondary analyses of Ni 2015; [26] Same study as Colgrove 2012 but with different outcome measures reported; [27] Same studies, but with different outcome measures reported; [28] 12-month follow-up study of Wong-Yu 2015a; [29] Same studies, but with different outcome measures; [30] Same studies, but with different outcome measures; [31] Same studies, but with different outcome measures; [32] Same studies, but with different outcome measures; [33] Same study as Kargarfard 2012, but with larger sample size; [34] Same study as Sandroff 2016, but with different outcome measures; [35] Same study as Silva-Batista 2016, but with different outcome measures; [36] Same study as Lin 2015, but with different outcome measures; [37] Same study as Kerling 2017, but woth different outcome measures

2-MST: 2-Minute Step Test; 2MWT: 2-Minute Walk Test; 3MWT: 3-Minute Walk test; 6MWT: 6-Minute Walk Test; 8-FT: 8-Foot Up and Go Test; 9-HPT: 9Hole Peg Test; 10mWT: 10-m Walk Test; 30CST: 30-second Chair Stand Test; 50mWT: 50-meter Walk Test; 500mWT: 500-meter Walk Test; ABC: Activities-specific Balance Confidence scale; ACIF: Acute Care Index of Function; ACS: Activity Card Sort; ACT: Arm Curl Test; AD: Alzheimer's disease; ADL: Activities of Daily Living; ALDS: Academic Medical Center linear disability score; BAI: Beck Anxiety Inventory; BBAT: Basic Body Awareness Therapy; BBS: Berg Balance Scale; BDI: Beck Depression Inventory; BDNF: Brain-derived neurotrophic factor; B'DS: Brown's Disability Scale; BESTest: Balance Evaluation Systems Test; Borg RPE scale: Borg Ratings of Perceived Exertion scale; BPRS: Brief Psychiatric Rating Scale; BRMS: Bech-Rafaelsen Melancholy Scale; BSI: Brief Symptom Inventory; BST: Back Scratch Test; CAHAI-8: Chedoke Arm and Hand Activity Inventory; CBT: Cognitive Behavioral Therapy; CDI-2: Children's Depression Inventory 2; CDSS: Calgary Depression Scale for Schizophrenia; CES-D: Center for Epidemiologic Studies Depression rating scale; CG: Control Group; C-GAS: Children's Global Assessment Scale; CGI: Clinical Global Impression; CGI-C: Clinical Global Impression of Change; CGI-S: Clinical Global Impression Severity scale; CGI-SCH: Clinical Global Impression-Schizophrenia; CIMT: Constraint-Induced Movement Therapy; CIS: Clinical Interview Schedule; CIS: Clinically Isolated Syndrome (in MS); CRP: C-reactive protein; CRT: Coin Rotation Task; CSF: CerebroSpinal Fluid; CSRT: Choice stepping reaction time; CSRT: Chair Sit and Reach Test; CST: Chair Stand Test; CWS: Comfortable Walking Speed; DASS-21: Depression Anxiety Stress Scale-21; DGI: Dynamic Gait Index; DHI: Dizziness Handicap Inventory; DIP: Disability and Impact Profile; DIS: Diagnostic Interview Schedule; DMBI: Dejian Mind-Body Intervention; dTUG: Dual-task Timed Up and GO test; EDSS: Expanded Disability Status Scale; EQ-5D: EuroQol health-related quality of life; EQ-5D VAS: EuroQoL 5D Visual Analogue Scale; FAB: Fullerton Advanced Balance scale; FAMS: Functional Assessment of MS; FES: Falls Efficacy Scale; FES-I: Falls Efficacy Scale-International questionnaire; FGA: Functional Gait Assessment; FIM: Functional Independence Measure; fMRI: Functional MRI; FOG: Freezing of Gait questionnaire; FR: Functional Reach; FRT: Functional Reach test; FSMC: Fatigue Scale for Motor and Cognitive functions; FSS: Fatigue Severity Scale; FSST: Four Square Step Test; FST: Functional Stair Test; FTSTS: Five Times Sit-To-Stand; GAF: Global Assessment of Functioning scale; GDS: Geriatric Depression Scale; GFQ: Gait and Falls Questionnaire; GHQ-12: General Health Questionnaire 12; GHQ-28: General Health Questionnaire-28; GLTEQ: Godin Leisure Time Exercise Questionnaire; GNDS: Guy's Neurological Disability Scale; GWBM: Post Graduate Institute general well-being measure; HADS: Hospital Anxiety and Depression Scale; HAP:

Human Activities Profile; HARS: Hamilton Anxiety Rating Scale; HAS: Hamilton Anxiety Scale; HAQUAMS: Hamburg Quality of Life Questionnaire in MS; HD: Huntington's Disease; HDQoL: Huntington's disease Health Related Quality of Life questionnaire; HDRS: Hamilton Depression Rating Scale; HR-QoL: Health-related Quality of Life; HY-stage: Hoehn and Yahr staging; IADL: Instrumental Activities of Daily Life; IDEAS: Indian disability evaluation and assessment scale; IDS-C30: Inventory of Depression Symptomatology-Clinician Rated; IFN-γ : Interferon-gamma; IG: Intervention Group; IGF-1: Insulin-like Growth Factor 1; IIQ: Incontinence Impact Questionnaire; IL-1β: Interleukin-1 beta; IL-4: Interleukine-4; IL-6: Interleukin-6; IL-17: Interleukine-17; IPA: Impact on Participation and Autonomy; iTBS: intermittent Theta Burst Stimulation; LAPAQ: Longitudinal aging study Amsterdam physical activity questionnaire; Lehman QoL: Lehman quality of Life Short Form TL30S; LOS: Limit Of Stability test; LR: Lateral Reach; LSSI: Lipp's Stress Symptoms Inventory; LSVT BIG therapy: Lee Silverman Voice Therapy BIG; MADRS: Montgomery Asberg depression Rating Scale; MAS: Modified Ashworth Scale for spasticity; MCP: Multicomponent cognitive program; MCT: Motor Control Test; MDD: Major Depressive Disorder; MDS-UPDRS I: Movement Disorder Society-Unified Parkinson's Disease Rating Scale Non-motor experiences; MDS-UPDRS III: Movement Disorder Society-Motor subscore of the Unified Parkinson's Disease Rating Scale; MDS-UPDRS-ADL (i.e. UPDRS-II): Movement Disorder Society-Activities of Daily Living assessed with second part of UPDRS; MEP: Motor Evoked Potential; mFC: modified Fitness counts exercise program focused on stretching, balance, breathing and non-progressive strengthening; MFE: Modified Figure-of-Eight test; MFI: Multidimensional Fatigue Inventory; MFIS: Modified Fatigue Impact Scale; MHI-18: 18-item Mental Health Inventory; MMSE: Mini-Mental State Examination; MoCA: Montreal Cognitive Assessment; M-PAS: Modified Parkinson Activity Scale; mPPT: modified Physical Performance Test; MPQ: McGill Pain Questionnaire; MS: Multiple Scelrosis; MRE: Magnetic Resonance Elastography; MSFC: MS Functional Composite (includes cognition); MSIS-29: MS Impact Scale-29; MSQOL-54: MS Quality of Life-54; MSSE: MS Self-Efficacy Scale; MSSS-88: MS Spasticity Scale-88; MSWS-12: MS 12-item walking scale; NFL: Neurofilament light; Ng: Neurogranin; NGF: Nerve Growth Factor; NHPB: Nine hole peg board test; NMSS: Non-motor Symptoms Scale; NPI: Neuropsychiatric Inventory; OGTT: Oral Glucose Tolerance Test; OLS: 1-Leg Stance; PANAS: Positive and Negative Affect Schedule; PANSS: Positive and Negative Syndrome Scale; PAS: Parkinson Activity Scale; PASE: Physical Activity Scale for the Elderly; PD: Parkinson's disease; PDDS: Parkinson's Disease Disability Scale; PDQ-8: Parkinson's Disease Questionnaire-short version; PDQ-39: Parkinson's Disease Questionnaire; PDQL: Parkinson's Disease Quality of Life scale; PFS: Parkinson's Fatigue Scale; PGMS: Philadelphia Geriatric Morale Scale; Phone-FITT: household and recreational physical activity interview; PHQ-9: Patient Health Questionnaire 9; POMA: Tinetti Performance-Oriented Mobility Assessment; POMS: Profile of Mood States; PPA: Physiological Profile Assessment; PP-MS: Primary Progressive MS; PPOS: Patient Preference Outcome Scale; PRET: Progressive Resistance Exercise Training of major muscle groups; PRT: Progressive Resistance Training; PS: Postural Sway test; PSI-PD: Patient-specific index for Parkinson's disease; PSP: Personal and Social Performance Scale; PSQI: Pittsburgh Sleep Quality Index; PSS-10: Perceived Stress Scale-10; PWI: Personal Well Being Index; PWSSTL Partial-weight-supported treadmill gait training; QIDS: Quick Inventory for Depression Symptomatology; QLDS: Quality of Life in depression Scale; QoL: Quality of Life; RAGT: Robot-Assisted Gait Training; RHS: Revised Hallucination Scale; RMDQ: Roland Morris Disability Questionnaire; RMI: Rivermead Mobility Index; RPE: Rating of Perceived Exertion Scale; RR-MS: Relapse remitting MS; RSES: Rosenberg Self Esteem Scale; RSS: Ruminative Responses Scale; RST: Rapid Step-Up Test; rTMS: repetitive Transcranial Magnetic Stimulation; SAFE: Sensory-attention focused exercise; SANS: Scale for the Assessment of Negative Symptoms; SAPS: Scale for the Assessment of Positive Symptoms; SAS: Self-assessment Parkinson's Disease Disability Scale; SCID-I: Structured Clinical Interview for DSM-IV Axis I Disorders; SCL-90: Symptom Checklist-90-R; SCT: Stair Climbing Test; SEES: Subjective Exercise Experiences Scale; SF-6D: Short Form 6 dimensions utility score; SF-12: 12-item Short Form Health Survey; SF-12 MCS: Mental Health Composite Score of SF-12; SF-12 PCS: Physical Health Composite Score of SF-12; SF-36: 36-item Short Form Health Survey; SGI: Subject Global Impression; SIGMA: Structured Interview Guide for the Montgomery-Asberg depression Rating Scale; SIP-68: short version of Sickness Impact Profile for measuring health-related functional status; SLS: Single Leg Stance test; sMRI: Structural MRI; SOFS: Social and occupational Functioning Scale; SOT: Sensory organization balance test; SP-MS: Secondary Progressive MS; SPPB: Short Physical Performance Battery; SRT: Sit and Reach Test; SSEP: Somatosensory Evoked Potential; SST: Stroop stepping test; STAI: State-Trait Anxiety Inventory; STS: Sit-to-Stand test; SWLS: Satisfaction with Life scale; SZ: Schizophrenia; T25FW: Timed 25 Foot Walk; TAU: Treatment as usual; TBARS: Thiobarbituric Acid-reactive substances; TCS: Timed Chair-Stand test; TIS: Trunk Impairment Scale; TMS: Transcranial Magnetic Stimulation; TRENDS: Tool for Recognition of Emotions in Neuropsychiatric Disorders; TUG: Timed Up and Go test; UHDRS: Unified Huntington's Disease Rating Scale; UPDRS:

Unified Parkinson's Disease Rating Scale; VAS: Visual Analogue Scale; VILIP-1: Visinin-like protein 1; VPS: Vitality Plus Scale; WBV: Whole Body Vibration; WHODAS: World Health Organization Disability Assessment Schedule; WHOQOL BREF: World Health Organization Quality of Life-BREF; YKL-40: Chitinase-3-like protein 1

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