

Supplementary Material

Can Physical Exercise Be Considered as a Promising Enhancer of Global Cognition in People with Parkinson's Disease? Results of a Systematic Review and Meta-Analysis

Supplementary Table 1. MEDLINE Ovid search strategy.

#	Searches
1	exp PARKINSON DISEASE/
2	parkinson*.tw,kf.
3	or/1-2
4	exp SOFTWARE/
5	software.mp.
6	game.mp.
7	gaming.mp.
8	play*.mp.
9	simulation*.mp.
10	program*.mp.
11	techni*.mp.
12	video.mp.
13	VIRTUAL REALITY EXPOSURE THERAPY/
14	user-computer interface.mp.
15	interactive.mp.
16	virtual*.mp.
17	vr.mp.
18	augmented.mp.
19	exergam*.mp.
20	kinect.mp.
21	nintendo wii.mp.
22	microsoft xbox.mp.
23	or/4-22
24	biofeedback.mp.
25	exp MOVEMENT/
26	movement.mp.
27	exp PHYSICAL THERAPY MODALITIES/
28	exp PHYSICAL FITNESS/
29	fitness.mp.
30	exp MUSCLE STRENGTH/

31	strength.mp.
32	muscle.mp.
33	locomot*.mp.
34	exp BODY WEIGHT/
35	(weight* adj1 body*).mp.
36	(weight* adj2 training*).mp.
37	motor activity.mp.
38	or/24-37
39	exp EXERCISE/
40	exercise*.mp.
41	activit*.mp.
42	sport*.mp.
43	train*.mp.
44	intervention*.mp.
45	condition*.mp.
46	exp PHYSICAL ENDURANCE/
47	endurance.mp.
48	exp GAIT/
49	gait*.mp.
50	postural balance.mp.
51	exp DANCING/
52	danc*.mp.
53	tango.mp.
54	exp MARTIAL ARTS/
55	martial art*.mp.
56	aerobic.mp.
57	(boxing or shadowboxing).mp.
58	treadmill*.mp.
59	karate.mp.
60	exp WALKING/
61	walking.mp.
62	BICYCLING/
63	bicycle*.mp.
64	or/39-63
65	MEDICINE, CHINESE TRADITIONAL/
66	traditional chinese exercise.mp.
67	or/65-66
68	exp MIND-BODY THERAPIES/

69	(mind adj1 body).mp.
70	Tai ji/
71	((chi adj1 tai) or (tai adj1 ji*) or taiji* or taichi* or t'ai chi).mp.
72	(wuqinxi or baduanjin or yijiejing).mp.
73	QIGONG/
74	(qi-gong* or qigong*).mp.
75	((qi* adj2 (gong* or kung* or chung* or gung*)) or (chi* adj2 (gong* or kung* or
76	yoga).mp.
77	(asana or pranayama or dhyana).mp.
78	pilates.mp.
79	or/68-78
80	exp REHABILITATION/
81	rehab*.mp.
82	exp THERAPEUTICS/
83	therap*.mp.
84	physical*.mp.
85	physiotherapy.mp.
86	exercise therapy.mp.
87	exp EXERCISE TEST/
88	exercise test.mp.
89	strengthening program*.mp.
90	progressive resistance training.mp.
91	cardiorespiratory.mp.
92	exp CARDIOVASCULAR SYSTEM/
93	cardiovascular.mp.
94	aqua*.mp.
95	hydrotherapy.mp.
96	(lsvt-big or lsvtbig).mp.
97	("Lee Silverman Voice Treatment" and big).mp.
98	periodicity.mp.
99	socio environmental.mp.
100	(whole body adj1 vibration*).mp.
101	or/80-100
102	23 or 38 or 64 or 67 or 79 or 101
103	randomized controlled trial.pt.
104	controlled clinical trial.pt.
105	randomi?ed.ab.
106	placebo.ab.

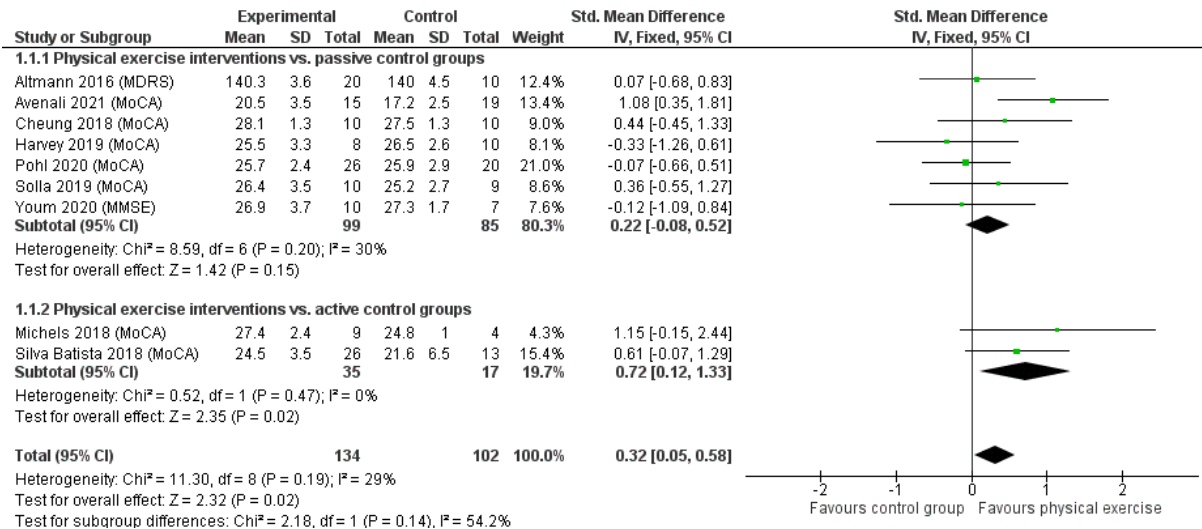
107	clinical trials as topic.sh.
108	randomly.ab.
109	trial.ti.
110	or/103-109
111	exp animals/ not humans/
112	110 not 111
113	3 and 102 and 112

Supplementary Table 2. Cognitive (sub-) domains assessed and instruments used in the studies

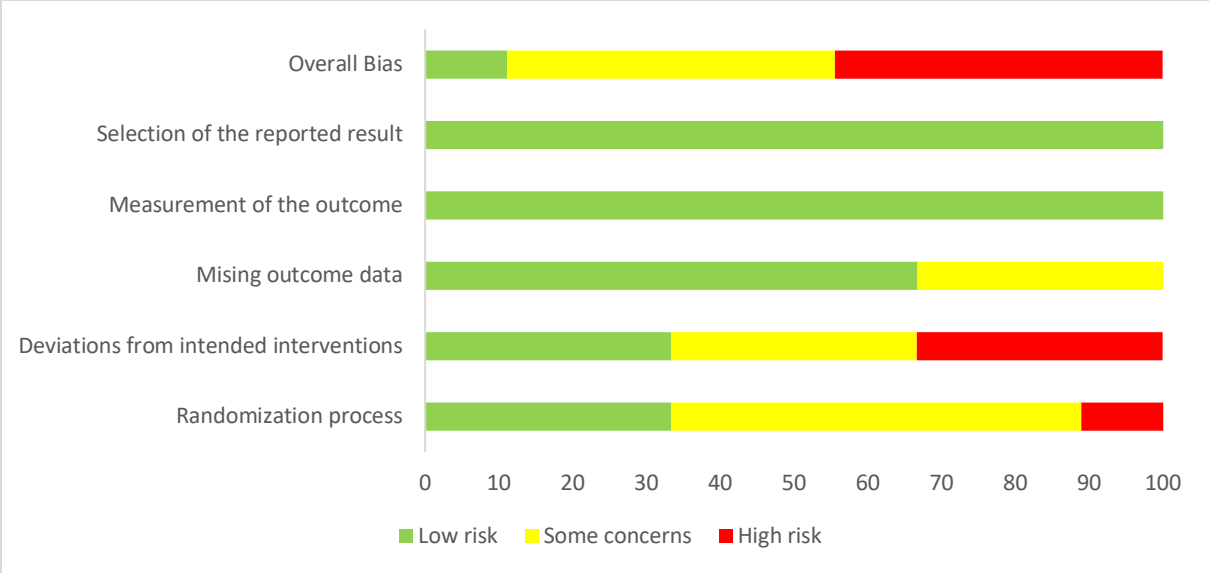
Study	Global cognition	Memory		Executive functions				Working Memory	Intelligence	Attention		Visuocognition	Language
		Verbal Memory	Visual Memory	Screening for executive functions/ other single tests	Fluency tasks	Interference control	Set-shifting			Fluid intelligence	Speed of processing		
<i>Physical exercise intervention vs. passive control group (N = 10)</i>													
Altmann 2016 [15]	MDRS					Stroop Interference		Operation span; Visual memory updating, Digit span backward; 1-back/ 2-back task		Stroop colours/ Stroop colour words; Simple attention; Digit Symbol Test	Digit span forward, 0-back task; Simple attention task		Picture Describing
Avenali 2021 [34]	MoCA, MMSE			FAB	Letter fluency		TMT-B		Raven's matrices 1947	TMT-A	Corsi's block-tapping test forward		
Cheung 2018 [29]	MoCA												
de Oliveira 2017 [33]				WCST					Raven colored progressive matrices				
Harvey 2019 [30]	MoCA												
Pohl 2013 [31]		Text recall test				Stroop interference	Parallel serial mental operations			Symbol digit modalities test		Clox & Cube	Naming
Pohl 2020 [35]	MoCA	Text recall test				Stroop interference				Symbol digit modalities test			
Silveira 2018 [32]		CVLT	ROFT		letter and semantic verbal fluency	Stroop interference	TMT-B	Digit span backward		Stroop colours/ Stroop colour words; TMT A	Corsi's block-tapping; Digit span forward	Benton Line Orientation Test; Copy of intersecting pentagons	Boston Naming Test
Solla 2019 [16]	MoCA												
Youn 2020 [36]	MMSE												
<i>Physical exercise intervention vs. active control group (N = 7)</i>													
Albrecht 2021 [42]		RAVLT	BVMT-R		D-KEFS design fluency test	Stroop Interference	TMT-B	Digit span backward		TMT-A	Digit span forward		
Gobbi 2021 [40]	MMSE	WMS-R: logical memory		WCST	Verbal fluency (semantic			Digit span backward	WAIS-III: Search symbol test		Digit span forward; Corsi's block-	Clock Drawing Test	

		I/II verbal paired associates			category after preselected letter)						tapping test forward		
Hasegawa 2020 [37]	MoCA												
Johansson 2020 [38]			BVMT-R: Recall		Verbal fluency (alternating semantic categories)	Stroop interference	TMT-B	Digit span backward		TMT-A	Digit span forward	BVMT-R: Copy condition	
Michels 2018 [39]	MoCA												
Picelli 2016 [14]	MoCA			FAB			TMT-B	Memory with interference test		TMT-A			
Silva-Batista 2018 [41]	MoCA												

BVMT-R, Brief Visuospatial Memory Test-Revised; CVLT, California Verbal Learning Test; D-KEFS, Delis-Kaplan Executive Function System; FAB, Frontal Assessment Battery; MDRS, Mattis Dementia Rating Scale; MoCA, Montreal Cognitive Assessment; MMSE, Mini-Mental State Examination; RAVLT, Ray Auditory Verbal Learning Test; ROFT, Rey-Osterrieth Complex Figure Test; WAIS-III, Wechsler Adult Intelligence Scale III; WCST, Wisconsin Card Sorting Test; WMS-R, Wechsler Memory Scale - Revised



Supplementary Figure 1. Sensitivity analysis using a fixed effects model. MDRS, Mattis Dementia Rating Scale; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment)



Supplementary Figure 2. Risk of bias graph