SUPPLEMENTAL CONTENT

Supplementary material e-1. Search strategy.

LILACS/SCIELO

“exercício” OR “atividade fïsica” AND “função cognitiva” OR “cognição” AND “idoso” OR “demência” OR “doença de alzheimer” OR “comprometimento cognitivo leve” OR “disfunção cognitiva” AND (instance:"regional") AND (db:("LILACS"));

MEDLINE (PUBMED)

#1 ("exercise"[MeSH Terms] OR "exercise"[All Fields]) AND ("cognition"[MeSH Terms] OR "cognition"[All Fields] OR ("cognitive"[All Fields] AND "function"[All Fields]) OR "cognitive function"[All Fields]) AND ("older adults"[All Fields] OR ("aged"[MeSH Terms] OR "aged"[All Fields] OR "elderly"[All Fields]))

#2 ("exercise"[MeSH Terms] OR "exercise"[All Fields]) AND ("cognition"[MeSH Terms] OR "cognition"[All Fields] OR ("cognitive"[All Fields] AND "function"[All Fields]) OR "cognitive function"[All Fields]) AND ("dementia"[MeSH Terms] OR "dementia"[All Fields])

#3 ("exercise"[MeSH Terms] OR "exercise"[All Fields]) AND ("cognition"[MeSH Terms] OR "cognition"[All Fields] OR ("cognitive"[All Fields] AND "function"[All Fields]) OR "cognitive function"[All Fields]) AND (cognitively [All Fields] AND impaired[All Fields] AND ("adult"[MeSH Terms] OR "adult"[All Fields] OR "adults"[All Fields]))

#4 ("exercise"[MeSH Terms] OR "exercise"[All Fields]) AND ("cognition"[MeSH Terms] OR "cognition"[All Fields] OR ("cognitive"[All Fields] AND "function"[All Fields]) OR "cognitive function"[All Fields]) AND ("cognitive dysfunction"[MeSH Terms] OR ("cognitive"[All Fields] AND "dysfunction"[All Fields]) OR "cognitive dysfunction"[All Fields] OR ("mild"[All Fields] AND "cognitive"[All Fields] AND "impairment"[All Fields]) OR "mild cognitive impairment"[All Fields])

PEDro (Physiotherapy Evidence Database)

#1 exercise cognitive function “older adult”

#2 exercise cognitive function elderly

#3 exercise cognitive function dementia

#4 exercise cognitive function cognitively impaired adults

#5 exercise cognitive function “mild cognitive impairment”

CENTRAL (Cochrane Central Register of Controlled Trials)

#1 exercise cognitive function “older adult”

#2 exercise cognitive function elderly

#3 exercise cognitive function dementia

#4 exercise cognitive function cognitively impaired adults

#5 exercise cognitive function “mild cognitive impairment”

Clinicaltrials.gov

#1 exercise cognitive function “older adult”

#2 exercise cognitive function elderly

#3 exercise cognitive function dementia

#4 exercise cognitive function cognitively impaired adults

#5 exercise cognitive function “mild cognitive impairment”

Figure e-1. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.

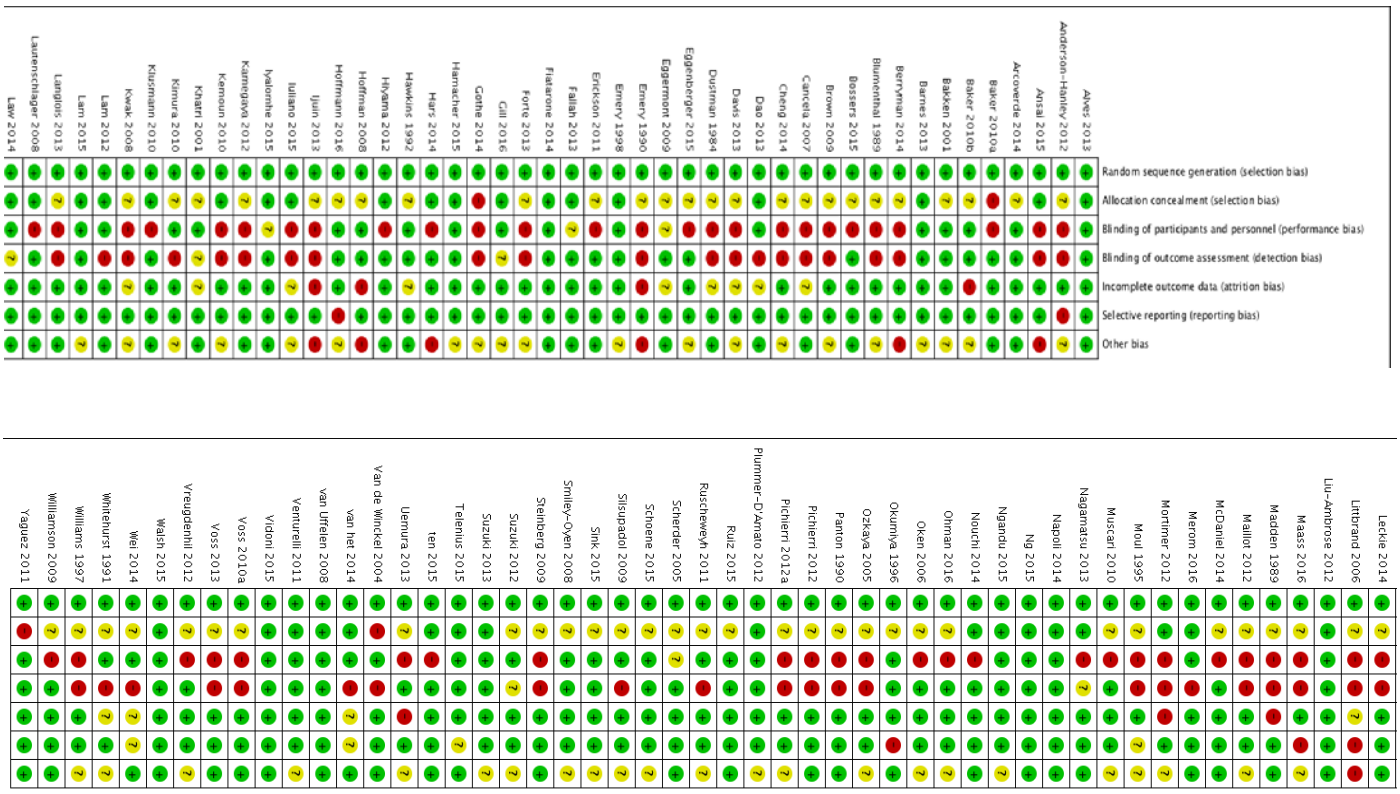

Table e-2. Summary of study characteristics from studies in the OHA group

Author	Sample n/ % female /mean age/ sedentary				Exercise mode	Control	Length of intervention Hours / Weeks		Session time (minutes)	Frequency	Intensity	Adherence
Alves, 2013	56	100%	66.8	Y	STG	NOE	32	24	40	2	70 – 89	High
Anderson-Hanley, 2012*	79	78.75%	78.65	NR	AE (cycling)	SBT	45	12	45	5	55 – 59	High
Baker (A), 2010	33	51.50%	70	Y	AE (stationary bike or elliptical)	SBT	91	26	52.5	4	75 – 85	Unclear
Baker (B), 2010	38	73.90%	70	Y	AE (SELF)	SBT	91	26	52.5	4	75 – 85	Medium
Berryman, 2014	47	61.70%	70.7	N	COMB (lower body STG + biking)	COMB (upper body STG+ biking)	24	8	60	3	60 – 65	High
Blumenthal, 1989	101	50.50%	67	NR	AE (cycling and walking)	MIND (Yoga)	48	16	60	3	70 – 89	High
Brown, 2009	126	83.34%	79.6	Y	STG	SBT	52	26	60	2	NR	Low
Dao, 2013	114	100%	69.44	NR	STG	SBT	104	52	60	2	70 – 89	Unclear
Dustman, 1984	43	37.20%	60.22	Y	AE (walking)	SBT	48	16	60	3	70 – 80	Unclear
Eggenberger, 2015	71	64.80%	77.3	NR	G1 = AE(walking treadmill) + COG / G2 = COMB (STG + walking)	AE (dancing)	52	26	60	2	55 – 69	Unclear
Emery, 1990	48	83.30%	72	Y	COMB (strength + walking)	NOE	36	12	60	3	70- 89	Medium
Emery, 1998	79	53.20%	66.6	NR	COMB (SELF)	NOE	45	10	65	5	NR	High
Erikson, 2011	120	66.50%	66.6	Y	AE (walking)	SBT	130	52	50	3	50 – 75	Medium
Fallah, 2013	155	100%	69.6	Y	STG	SBT	78	52	60	1.5	35 – 54	Medium
Forte, 2013	42	61.90%	69.8	Y	COMB (STG + walking, stepping) + COG	STG	24	12	60	2	70 – 89	High
Gothe, 2014	118	77.90%	62	Y	MIND (Yoga)	SBT	24	8	60	3	NR	High
Hamacher, 2015	35	60%	67.88	Y	AE (dancing)	NOE	78	26	90	2	70 – 89	Medium
Hars, 2013	134	96.20%	75.5	N	AE (walking) + cognitive	NOE	26	26	60	1	55 – 69	High
Hawkins, 1992	36	72%	68.2	Y	Other (WATER)	NOE	22.5	10	45	3	-NR	Unclear
Hiyama, 2011	40	100%	72.85	NR	COMB (strength + walking) + COG	COMB(walking)	NR	4	NR	7	55 – 69	Unclear
Hoffman, 2008	202	75.74%	51.7	Y	AE (SELF)	NOE	NR	16	NR	3	70 – 85	High
Ijuin, 2013	65	56.90%	73.62	N	AE (walking)	NOE	30	20	90	1	NR	Medium
Iuliano, 2015	80	60%	66.96	Y	G1 = STG / G2 = AE (SELF)	SBT	18	12	30	3	60 – 85	Unclear
Kamegaya, 2012*	30	86.70%	73.7	NR	COMB(STG + walking)	NOE	9	12	45	1	NR	Medium
Khatri, 2001	84	76.20%	56.73	NR	AE (SELF)	NOE	32	16	40	3	75 – 80	Unclear
Kimura, 2010	119	58.80%	74.4	NR	STG	NOE	36	12	90	2	55 – 69	Unclear
Klusmann, 2010	230	100%	73.6	Y	COMB (STG + biking or treadmill)	NOE	117	26	90	3	NR	Unclear
Langlois, 2012	72	77.70%	72.39	Y	COMB (STG + SELF)	NOE	36	12	60	3	70 – 89	Unclear
Leckie, 2014	179	64.10%	66.82	Y	AE (walking)	Stretching and toning	43.3	52	50	1	50 – 75	Unclear
Liu-Ambroise, 2012	52	100%	69.27	Y	STG	NOE	NR	52	NR	2	70 – 89	Medium
Maass, 2015	40	55%	68.4	Y	AE (treadmill)	SBT	27	12	45	3	50 – 75	Unclear

Madden, 1989	79	49.30%	66.98	Y	G1 = AE (biking) / G2 = MIND (Yoga)	NOE	36	16	45	3	70 – 89	High
Maillot, 2012	32	84.30%	73.47	Y	Other (Wi fit)	NOE	24	12	60	2	30 – 50	High
McDaniel, 2014	96	63.50%	65.5	Y	AE (treadmill) + COG	NOE	65	26	50	3	65 – 85	High
Merom, 2016	79	85%	69.5	N	AE (dancing)	AE(walking)	32	32	60	1	50 – 75	Medium
Motimer, 2012	148	65.54%	67.8	Y	G1 = MIND (Tai-chi) / G2 = AE (walking)	NOE	100	40	50	3	50 – 75	Unclear
Moul, 1995	30	63.30%	69.1	Y	G1 = AE (walking) / G2 =STG	SBT	60	16	45	5	55 – 69	Unclear
Muscari, 2010	120	40.35%	69.3	NR	AE (SELF)	NOE	156	52	60	3	70 – 89	Unclear
Ngandu, 2015	1190	46%	69.35	no	COMB (STG+ SELF) + COG	NOE	NR	104	NR	3	55 – 69	High
Nouchi, 2014	61	NR	66.9	Y	COMB (STG + SELF)	NOE	6	4	30	3	60 – 80	Unclear
Oken, 2006	134	74.10%	72.1	Y	G1 = MIND (Yoga) / G2 = AE (walking)	NOE	32.5	26	75	1	70 – 89	Medium
Okumiya, 1996	42	57.12%	78.8	NR	AE (walking)	NOE	48	24	60	2	-	High
Ozkaya, 2005	36	31.80%	73	Y	STG	NOE	18.25	9	50	3	70 – 89	Unclear
Panton, 1990	49	53%	71.96	Y	AE (walking and jogging)	STG	39	26	30	3	50 – 85	Unclear
Pichierri A, 2012	31	81.80%	86.2	NR	COMB (STG + dancing)	STG + SBT	22	12	55	2	70 – 89	High
Pichierri B, 2012	25	60%	86.2	NR	STGh + COG	NOE	24	12	60	2	70 – 89	High
Plummer, 2012*	17	94.10%	84.9	NR	AE (walking) + COG	SBT	12	4	45	4	35 – 54	Unclear
Ruscheweyh , 2011	62	69.35%	60.2	Y	AE (walking)	NOE	65	26	50	3	50 – 60	Unclear
Shoene 2015	81	66%	81.5	NR	AE (stepping) + COG	NOE	22	16	27.4	3	NR	Medium
Silsupadol, 2009	24	NR	65	NR	G1 = SBT + COG / G2 = SBT + COG (different protocol)	SBT	9	4	45	3	55 – 69	Unclear
Sink, 2015	1476	68%	78.9	Y	COMB (STG + walking)	SBT + education	300	104	50	3.5	55 – 69	Medium
Smiley-Oyen, 2008	57	71.90%	69.86	Y	AE (SELF)	STG + MIND (tai chi) + SBT	105	42	50	3	45 – 80	Unclear
Tze Pin Ng, 2015	151	61.40%	70	Y	COMB (STG + SELF)	NOE	86.7	26	120	3	60 – 80	High
Van het Reve, 2014	145	68.90%	81.5	N	STG + COG	STG + SBT	22	12	40	2	NR	High
Vidoni, 2015	101	64.17%	72.92	Y	AE (walking treadmill)	NOE	65	26	50	4	40 – 75	High
Voss, 2010	65	72%	66.33	Y	AE (walking)	SBT	104	52	40	3	50 – 75	Medium
Voss, 2012	70	64.20%	64.87	Y	AE (walking)	SBT	104	52	40	3	50 – 75	High
Walsh, 2015	60	66.60%	63.72	N	MIND (Tai-chi)	NOE	52	26	30	4	NR	Medium
Whitehurst , 1991	14	100%	65	Y	AE (cycling)	NOE	16	8	37.5	3	70 – 80	Unclear
Williams and Lord, 1997	197	100%	71.43	Y	AE (walking)	NOE	84	46	60	2	NR	High

Abbreviations: AE = aerobic training; STG = resistance training; COMB = combination (resistance training and aerobic training; MIND = mind body exercises; SBT = stretching/balance/toning; NOE = no exercise; SELF = aerobic self-choice; COG = cognitive activity; Y = sedentary; N = non-sedentary; NR = not reported; G1 = group 01; G2 = group 02.

* notes article that was included in more than one group.

Table e-3. Summary of study characteristics from studies in the MCI group.

Author	Sample n/ % female /mean age/ sedentary				Exercise mode	Control	Length of intervention Hours / Weeks		Session time (minutes)	Frequency	Intensity	Adherence
Ansai, 2015	69	68.10%	82.4	Y	G1 = COMB (cycling) / G2 = STG	NOE	48	16	60	3	60 – 85	Low
Anderson-Hanley, 2012*	79	78.75%	78.65	NR	AE (cycling)	SBT	45	12	45	5	55 – 59	High
Arcoverde, 2014	20	55%	78.75	Y	AE (treadmill)	NOE	16	16	30	2	60 – 84	High
Bakken, 2001	10	60%	83.2	Y/ N	AE (walking, stationary biking)	NOE	20	8	50	3	70 – 89	High
Barnes, 2013	126	62.70%	73.4	Y	G1 = AE (dancing) / G2 = COG	G1 = SBT / G2 = COG	36	12	60	3	60 – 75	Unclear
Carral, 2007	62	100%	68.4	N	STG + WATER	Other (WATER + Calisthenics)	110	22	60	5	70 – 85	High
Davis, 2013	86	100%	75	NR	G1 = STG / G2 = AE (walking)	SBT	52	26	60	2	40 – 60	Low
Gill, 2016	44	68%	73.5	N	COMB (SELF) + COG	COMB (SELF)	65	26	107.5	2.5	70 – 85	High
Iyalomhe, 2015	10	70%	71.5	NR	AE (SELF)	SBT	35	26	50	2	70 – 89	Unclear
Kamegaya, 2012*	30	86.70%	73.7	NR	COMB (STG + walking)	NOE	9	12	45	1	NR	Medium
Lam, 2012	389	76.34%	77.7	Y	MIND (Tai-chi)	SBT	78	52	30	3	35 – 54	Unclear
Lam, 2015	555	78.20%	75.4	NR	G1 = MIND (Tai-chi) + AE / G2 =MIND (Tai-chi) + AE + COG	G1 = NOE/ G2 = COG	156	52	60	3	NR	Medium
LautenSchlager , 2008	170	50.50%	68.65	N	AE	NOE	60	24	50	3	NR	Medium
Law, 2014	83	60.24%	73.8	NR	COMB (SELF)	COG only	9.75	10	45	1.3	NR	High
Nagamatsu, 2013	86	100%	74.87	Y	STG	AE (walking)	26	52	60	2	70 - 80	Low
Napoli, 2014	107	62.62%	70	Y	COMB (SELF)	NOE	234	52	90	3	70 - 85	High
Plummer, 2012*	17	94.10%	76.65	NR	AE (walking) + COG	SBT	12	4	45	4	35 – 54	Unclear
Scherder, 2005	43	88.40%	86	Y	AE (walking)	NOE	9	6	30	3	55 – 69	Unclear
Singh, 2015	100	68%	70.1	NR	STG + COG	G1 = COG / G2 = SBT + COG	65	26	80	2	70 – 89	Low
Suzuki, 2013	50	46%	76	NR	COMB + COG (SELF)	NOE	156	52	90	2	55- 69	Medium
Suzuki, 2012	100	45%	75.4	NR	COMB (SELF) + COG	NOE	156	52	90	2	55 – 69	High
ten Brinke, 2015	77	100%	75.09	Y	G1 = AE (walking) / G2 = STG	SBT	52	26	60	2	40 – 80	Low
Uemura, 2013	44	54.54%	74.8	NR	COMB (walking)	NOE	78	26	90	2	40 – 60	High
Van Uffelen, 2008	152	44%	75	N	AE (walking)	SBT	104	52	60	2	55 – 69	Medium
Wei, 2014	60	33.30%	66	NR	AE (handball)	NOE	65	26	30	5	55 – 69	Unclear
Williamson, 2009	102	70.60%	77.43	Y	COMB (walking)	NOE	130	52	50	3	55 – 69	Unclear

Abbreviations: AE = aerobic training; STG = resistance training; COMB = combination (resistance training and aerobic training; MIND = mind body exercises; SBT = stretching/balance/toning; NOE = no exercise; SELF = aerobic self-choice; COG = cognitive activity; Y = sedentary; N = non-sedentary; NR = not reported; G1 = group 01; G2 = group 02.

* notes article that was included in more than one group.

After AE and COMB, between parentheses, we have the aerobic modality of the article.

Table e-4. Summary of study characteristics from studies in the dementia group.

Author	Sample n/ % female /mean age/ sedentary				Exercise mode	Control	Length of intervention Hours / Weeks		Session time (minutes)	Frequency	Intensity	Adherence
Bossers, 2015	109	75.53	85.5	NR	G1 = COMB (walking) / G2 = AE (walking)	NOE	36	9	60	4	50 – 85	High
Cheng, 2014	110	64.67%	80.9	Y	G1 = MIND (Mahjong) / G2 = MIND (Yoga)	NOE	NR	12	NR	3	NR	Unclear
Eggermont, 2009	94	81.40%	85.4	Y	AE (walking)	NOE	15	6	30	5	55 – 69	Unclear
Hoffman, 2015	200	43%	70.5	Y	COMB (biking, treadmill)	NOE	48	16	60	3	70 – 80	High
Kemoun, 2010	31	74.20%	81.8	Y	AE (walking)	NOE	45	15	60	3	60 – 70	High
Kwak, 2008	30	100%	80.97	Y	AE (walking)	NOE	117	52	45	2.5	55 – 69	Unclear
Littbrand, 2006	91	74%	85.3	NR	COMB (walking)	NOE	24.3	13	45	2.5	70 – 89	Medium
Ohman, 2016	161	38.57%	78.1	Y	COMB + COG (walking)	NOE	104	52	60	2	NR	Medium
Ruiz, 2015	40	80%	92.2	Y	COMB (cycling)	NOE	18	8	45	3	35 – 54	Medium
Steinberg, 2008	27	70.37%	75.25	NR	COMB (walking)	NOE	NR	12	NR	3	55 – 69	Medium
Telenius, 2015	170	73.50%	86.9	Y	COMB (SELF)	NOE	24	12	60	2	70 – 89	Medium
Van de Winckel, 2004	25	100%	81	NR	COMB (SELF)	NOE	42	12	30	7	NR	Unclear
Venturelli, 2011	21	100%	84	Y	AE (walking)	NOE	48	24	30	4	55 – 69	High
Vrugdenhil, 2012	40	60%	74.1	Y	COMB walking)	NOE	112	16	60	7	50 – 75	Unclear
Yaguez, 2010	27	59.25%	73.1	NR	STG	NOE	12	6	120	1	NR	High

Abbreviations: AE = aerobic training; STG = resistance training; COMB = combination (resistance training and aerobic training; MIND = mind body exercises; SBT = stretching/balance/toning; NOE = no exercise; SELF = aerobic self-choice; COG = cognitive activity; Y = sedentary; N = non-sedentary; NR = not reported; G1 = group 01; G2 = group 02.

After AE and COMB, between parentheses, we have the aerobic modality of the article.

Table e-5. Spearman rho correlation between improved cognitive performance and the following exercise dose parameters: session duration in minutes, length of intervention in total weeks, length of intervention in total hours, length of intervention in minutes per week, frequency in average of visits per week.

Variable	1	2	3	4	5
1. improved cognitive performance					
2. session duration in minutes	0.2				
3. length of intervention in total weeks	0.16	0.2			
4. length of intervention in total hours	0.24*	0.34**	0.85**		
5. length of intervention in minutes per week	0.15	0.37**	-0.05	0.44**	
6. frequency in average of visits per week	-0.04	-0.39**	-0.23*	0.16	0.63**

* Correlation significant at the 0.05 level (two-tailed).
** Correlation significant at the 0.01 level (two-tailed).

e-references. Reference list of all included studies.

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