Correction to: Attempting to Separate Placebo Effects from Exercise in Chronic Pain: A Systematic Review and Meta-analysis

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Abstract

Results section, sentence 2:

In the sentence beginning ‘Pairwise meta-analysis...’, the value ‘ $I^2=92.4\%$ ’ should have read ‘ $I^2=92.46\%$ ’.

Results section, sentence 3:

In the sentence beginning ‘Exercise training...’, the text ‘controls (g [95% CI]: 1.02 [0.67, 1.36], $P < 0.001$, $I^2=92.99\%$, studies: $n=42$), usual-care controls (g [95% CI]: 0.65 [0.41, 0.89], $P < 0.001$, $I^2=84.82\%$, studies: $n=33$)’ should have read ‘(g [95% CI]: 0.99 [0.66, 1.32], $P < 0.001$, $I^2=92.43\%$, studies: $n=42$), usual care controls

(g [95% CI]: 0.64 [0.44, 0.83], $P < 0.001$, $I^2=76.52\%$, studies: $n=33$)’ and when all controls combined (g [95% CI]: 0.86 [0.64, 1.07], $P < 0.001$, $I^2=91.37\%$, studies: $n=79$).

Section 3.2, sentence 1:

In the sentence beginning ‘The details of...’, the number ‘ $n=4719$ ’ should have read ‘ $n=4843$ ’.

Section 3.4, paragraph 1, sentence 3:

In the sentence beginning ‘Pairwise meta-analysis...’, the value ‘ $I^2=92.4\%$ ’ should have read ‘ $I^2=92.46\%$ ’, the value $n=251$ should have read $n=253$.

Section 3.4, paragraph 1, sentence 4:

In the sentence beginning ‘There was no...’, the value ‘ $P=0.249$ ’ should have read ‘ $P=0.250$ ’.

Section 3.4, paragraph 2, sentence 1:

In the sentence beginning ‘When pooling all...’, the text ‘(g [95% CI]: 0.86 [0.64, 1.07], $P < 0.001$, $I^2=91.37\%$, studies: $n=79$, participants: $n=4,719$; Fig. 4, Table 2).’ should have read ‘(g [95% CI]: 0.84 [0.64, 1.04], $P < 0.001$, $I^2=90.02\%$, studies: $n=79$, participants: $n=4843$; Fig. 4, Table 2).’

Section 3.4, paragraph 3, sentence 1:

In the sentence beginning ‘Sub-group analysis...’, the text ‘(g [95% CI]: 1.02 [0.67, 1.36], $P < 0.001$, $I^2=92.99\%$, studies: $n=42$, participants: $n=2,337$; Fig. 5, Table 2);’ should have read ‘(g [95% CI]: 0.99 [0.66, 1.32], $P < 0.001$, $I^2=92.43\%$, studies: $n=42$, participants: $n=2361$; Fig. 5, Table 2);’.

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Section 3.4, paragraph 4, sentence 1:

In the sentence beginning, ‘When comparing...’, the text ‘(*g* [95% CI]: 0.65 [0.41, 0.89], $P < 0.001$, $I^2 = 84.82\%$, studies: $n = 33$, participants: $n = 1,395$; Fig. 6, Table 2),’ should read ‘(*g* [95% CI]: 0.64 [0.44, 0.83], $P < 0.001$, $I^2 = 76.52\%$, studies: $n = 33$, participants: $n = 2229$; Fig. 6, Table 2),’.

Section 3.5, sentence 2:

In the sentence beginning ‘Among these few...’, the value ‘ $I^2 = 92.4\%$ ’ should have read ‘ $I^2 = 92.46\%$ ’.

Section 4, paragraph 4, sentence 6:

In the sentence beginning, ‘For pain intensity, the regression coefficient was 0.064 (95% CI: -0.002 , 0.1305 ; $P = 0.057$) and R^2 was 51.3%’ should have been ‘0.064 (95% CI: -0.002 , 0.131 ; $P = 0.057$) and R^2 was 51.3%’.

In the sentence beginning, ‘The test statistic...’, the value ‘14.85’ should have been ‘14.91’.

Table 1 should be replaced by the following version:

Table 1 Characteristics of included studies

Study	Primary musculoskeletal condition	Study duration (weeks)	Group allocation	N	Mean age (years)	Baseline pain (mean $\pm$ SD)	Follow up pain (mean $\pm$ SD)
Assumpcao et al. (2018) [64]	Fibromyalgia	12	Resistance training; 40 min; 2 $\times$ per week	16	45.7	VAS 5.30 $\pm$ 2.50	4.40 $\pm$ 3.00
			Stretching; 40 min; 2 $\times$ per week	14	47.9	VAS 5.60 $\pm$ 1.80	4.60 $\pm$ 2.60
Baptista et al. (2012) [55]	Fibromyalgia	16	Usual care control	14	46.9	VAS 6.00 $\pm$ 2.60	6.40 $\pm$ 2.70
			Aerobic training (belly dancing); 60 min; 2 $\times$ per week	40	49.5	VAS 7.70 $\pm$ 1.70	4.60 $\pm$ 2.00
			True control	40	49.1	VAS 7.50 $\pm$ 1.30	7.50 $\pm$ 1.40
Collado-Mateo et al. (2017) [54]	Fibromyalgia	8	Mindful exercise (Kinect exergame); 60 min; 2 $\times$ per week	42	52.5	FIQ 6.69 $\pm$ 1.99	5.37 $\pm$ 1.89
Da Costa et al. (2005) [46]	Fibromyalgia	12	True control	41	52.5	FIQ 5.95 $\pm$ 2.01	6.70 $\pm$ 2.20
			Aerobic home-based activity; individual session duration not specified but had to total 60-120 min per week	39	49.2	VAS 48.25 $\pm$ 21.18	36.85 $\pm$ 21.18
Etnier et al. (2009) [44]	Fibromyalgia	18	Usual care control	40	52.3	VAS 47.20 $\pm$ 21.41	44.42 $\pm$ 21.41
			Aerobic and resistance training; 60 min; 3 $\times$ per week	7	-	FIQ 5.19 $\pm$ 3.23	4.36 $\pm$ 1.75
Garcia-Martinez et al. (2012) [56]	Fibromyalgia	12	True control	7	-	FIQ 7.50 $\pm$ 1.34	7.14 $\pm$ 2.01
			Aerobic and resistance training; 60 min; 3 $\times$ per week	12	59.3	SF-36 26.70 $\pm$ 21.40	47.50 $\pm$ 21.80
Gusi et al. (2006) [47]	Fibromyalgia	12	True control	13	58.6	SF-36 34.60 $\pm$ 15.00	25.20 $\pm$ 12.90
			Aerobic training (hydrotherapy); 60 min; 3 $\times$ per week	17	51	VAS 6.31 $\pm$ 2.60	4.47 $\pm$ 2.60
Izquierdo-Alventosa et al. (2020) [111]	Fibromyalgia	8	True control	17	51	VAS 6.39 $\pm$ 2.50	6.49 $\pm$ 2.50
			Aerobic and resistance training 60 min, 2 $\times$ per week	16	53.3	VAS 6.13 $\pm$ 2.22	5.38 $\pm$ 2.16
Hakkinen et al. (2001) [57]	Fibromyalgia	21	Usual care control	16		VAS 5.63 $\pm$ 1.75	5.50 $\pm$ 2.25
			Resistance training and stretching; unspecified session duration; 2 $\times$ per week	11	39	VAS 4.80 $\pm$ 2.50	2.40 $\pm$ 1.90
Kayo et al. (2012) [53]	Fibromyalgia	16	True control	10	37	VAS 3.50 $\pm$ 1.90	6.00 $\pm$ 2.70
			Aerobic training (walking) and stretching; 60 min; 3 $\times$ per week	30	47.7	VAS 8.62 $\pm$ 1.61	5.10 $\pm$ 2.96
			Resistance training; 60 min; 3 $\times$ per week	30	46.7	VAS 8.67 $\pm$ 1.63	4.73 $\pm$ 3.29
			Usual care control	30	46.1	VAS 8.37 $\pm$ 1.45	6.47 $\pm$ 2.30

Table 1 (continued)

Study	Primary musculoskeletal condition	Study duration (weeks)	Group allocation	N	Mean age (years)	Baseline pain (mean $\pm$ SD)	Follow up pain (mean $\pm$ SD)
King et al. (2002) [65]	Fibromyalgia	12	Aerobic training; 10-40 min; 3 $\times$ per week	42	45.2	Total TP 105.30 $\pm$ 38.80	107.50 $\pm$ 36.60
McBeth et al. (2012) [121]	Fibromyalgia	24	True control	34	47.3	Total TP 101.10 $\pm$ 31.50	95.10 $\pm$ 30.80
			Aerobic training; 20-60 min; 2 $\times$ per week	92	55.3	SF-36 not reported	57.60 $\pm$ 19.50
Mengshoel et al. (1992) [41]	Fibromyalgia	20	Usual care control	88	56.3	SF-36 not reported	53.50 $\pm$ 21.30
			Aerobic training (low impact dancing); 60 min; 2 $\times$ per week	11	33.5	VAS 4.60 $\pm$ 2.32	5.72 $\pm$ 1.73
Nichols et al. (1994) [117]	Fibromyalgia	8	True control	14	34	VAS 5.90 $\pm$ 1.52	5.78 $\pm$ 2.25
			Aerobic training; 20 min; 3 $\times$ per week	10	47.8	MPQ-PRI not reported	22.00 $\pm$ 15.10
Sanudo et al. (2011) [58]	Fibromyalgia	24	True control	10	50.8	MPQ-PRI not reported	19.80 $\pm$ 10.30
			Aerobic and resistance training; 60 min; 2 $\times$ per week	21	55.5	SF-36 23.20 $\pm$ 17.40	29.90 $\pm$ 16.80
Schachter et al. (2003) [59]	Fibromyalgia	16	Usual care control	21	56.2	SF-36 23.60 $\pm$ 17.70	19.50 $\pm$ 18.10
			Aerobic training (short); 5 min initial session and progressing to 15 min by week 9; 3-5 $\times$ per week; 2 $\times$ per day (4 h separation)	56	41	VAS 5.60 $\pm$ 2.26	5.80 $\pm$ 2.48
Sencan et al. (2004) [60]	Fibromyalgia	6	Aerobic training (long); 10 min initial session and progressing to 30 min by week 9; 3-5 $\times$ per week; 1 $\times$ per day	51	38	VAS 5.80 $\pm$ 2.26	5.30 $\pm$ 2.27
			Usual care control	36	43.8	VAS 6.10 $\pm$ 1.97	5.60 $\pm$ 2.16
Tomas-Carus et al. (2007) [63]	Fibromyalgia	12	Aerobic training; 40 min; 3 $\times$ per week	20	35.4	VAS 6.85 $\pm$ 1.23	4.05 $\pm$ 0.91
			Placebo TENS; 20 min; 3 $\times$ per week	20	35.6	VAS 7.70 $\pm$ 1.72	6.20 $\pm$ 1.81
Tomas-Carus et al. (2008) [61]	Fibromyalgia	32	Hydrotherapy; 60 min; 3 $\times$ per week	17	51	FIQ 6.10 $\pm$ 2.60	4.50 $\pm$ 2.50
			Usual care control	17	51	FIQ 6.40 $\pm$ 2.50	6.50 $\pm$ 2.50
Tomas-Carus et al. (2008) [61]	Fibromyalgia	32	Hydrotherapy; 60 min; 3 $\times$ per week	15	50.7	FIQ 5.60 $\pm$ 1.90	5.30 $\pm$ 1.40
			True control	15	50.9	FIQ 6.40 $\pm$ 2.30	6.60 $\pm$ 1.80

Table 1 (continued)

Study	Primary musculoskeletal condition	Study duration (weeks)	Group allocation	N	Mean age (years)	Baseline pain (mean $\pm$ SD)	Follow up pain (mean $\pm$ SD)
Tomas-Carus et al. (2009) [62]	Fibromyalgia	32	Hydrotherapy; 60 min; 3 $\times$ per week	15	50.7	SF-36 28.70 $\pm$ 13.40	51.70 $\pm$ 13.10
Valkeinen et al. (2008) [119]	Fibromyalgia	21	True control	15	50.9	SF-36 20.80 $\pm$ 19.20	27.10 $\pm$ 20.90
			Aerobic and resistance training; 60-90 min, 1-2 $\times$ per week of resistance training; 60 min, 1-2 $\times$ per week aerobic training	13	59	VAS 54.00 $\pm$ 24.57	34.15 $\pm$ 24.57
Wigers et al. (1996) [120]	Fibromyalgia	14	Usual care control	11	58	VAS 35.18 $\pm$ 19.60	31.00 $\pm$ 19.60
			Aerobic training; 45 min; 3 $\times$ per week	20	43	VAS 72 $\pm$ 19	62 $\pm$ 21
Wong et al. (2018) [52]	Fibromyalgia	12	Usual care	20	46	VAS 65 $\pm$ 17	72 $\pm$ 24
			Mindful exercise (Tai Chi); 55 min; 3 $\times$ per week	17	51	VAS 7.50 $\pm$ 1.65	5.30 $\pm$ 1.23
Cho et al. (2014) [95]	Low back pain	4	Usual care control	14	51	VAS 7.30 $\pm$ 1.50	7.00 $\pm$ 1.87
			Resistance training (CORE program); 30 min; 3 $\times$ per week	15	38.1	VAS 4.16 $\pm$ 0.74	2.15 $\pm$ 0.57
Alikhajeh et al. (2021) [110]	Low back pain	6	Usual care control	15	36.5	VAS 3.85 $\pm$ 0.85	3.76 $\pm$ 1.05
			Hydrotherapy; 60 min; 3 $\times$ per week	12	51.6	VAS 5.90 $\pm$ 0.50	0.50 $\pm$ 0.40
Cortell-Tormo et al. (2018) [84]	Low back pain	12	True control	12	50.7	VAS 5.80 $\pm$ 0.80	6.00 $\pm$ 0.60
			Resistance training; 45-60 min; 2 $\times$ per week	11	35.6	VAS 4.00 $\pm$ 1.80	1.50 $\pm$ 1.50
Madadi-Shad et al. (2020) [112]	Low back pain	16	True control	8	35.6	VAS 4.50 $\pm$ 1.60	4.40 $\pm$ 1.40
			Stretching and resistance training; 50 min, 3 $\times$ per week	18	68.0	VAS 45.70 $\pm$ 5.30	28.20 $\pm$ 6.60
McIlveen et al. (1998) [116]	Low back pain	4	True control	18	68.9	VAS 46.00 $\pm$ 3.90	47.70 $\pm$ 5.20
			Hydrotherapy; 60 min; 2 $\times$ per week	45	57.2	MPQ-PPI 1.80 $\pm$ 0.70	0.50 $\pm$ 0.80
Prado et al. (2020) [113]	Low back pain	6	True control	50	58.4	MPQ-PPI 1.60 $\pm$ 0.80	1.60 $\pm$ 0.80
			Isostretching; 45 min; 2 $\times$ per week	27	35	VAS 5.50 $\pm$ 2.10	2.00 $\pm$ 2.70
			Usual care control	27	33	VAS 5.00 $\pm$ 1.50	4.10 $\pm$ 2.30

Table 1 (continued)

Study	Primary musculoskeletal condition	Study duration (weeks)	Group allocation	N	Mean age (years)	Baseline pain (mean $\pm$ SD)	Follow up pain (mean $\pm$ SD)
Costa et al. (2009) [85]	Low back pain	8	Motor control exercise; 30 min; 2 $\times$ per week (first month), 1 $\times$ per week (second month)	77	54.6	NRS 6.80 $\pm$ 2.10	4.60 $\pm$ 2.80
Da Fonseca et al. (2009) [97]	Low back pain	8	Placebo (detuned shortwave diathermy/ultrasound); 30 min; 2 $\times$ per week (first month), 1 $\times$ per week (second month)	77	52.8	NRS 6.60 $\pm$ 2.00	5.60 $\pm$ 2.60
			Mindful exercise (Pilates); unspecified session duration; 2 $\times$ per week	8	31.6	VAS 5.90 $\pm$ 2.00	3.00 $\pm$ 3.40
			True control	9	34.4	VAS 6.10 $\pm$ 1.80	4.90 $\pm$ 2.50
Gladwell et al. (2006) [96]	Low back pain	6	Mindful exercise (Pilates); 60 min 1 $\times$ per week (class), 30 min 2 $\times$ per week (home)	20	36.9	VAS 2.70 $\pm$ 0.90	2.20 $\pm$ 0.90
Jackson et al. (2011) [86]	Low back pain	12	Usual care control	14	45.9	VAS 2.40 $\pm$ 0.90	2.40 $\pm$ 0.80
			Resistance training (periodised) middle aged; unspecified session duration; 4 $\times$ per week	15	52	VAS 4.30 $\pm$ 0.90	3.20 $\pm$ 0.90
			Resistance training (periodised) older aged; unspecified session duration; 4 $\times$ per week	15	63	VAS 4.50 $\pm$ 0.80	3.30 $\pm$ 0.70
Keane (2016) [122]	Low back pain	12	Usual care control	15	57	VAS 4.20 $\pm$ 0.60	4.50 $\pm$ 0.80
			Stretching in pool; 30 min; 2 $\times$ per week	10	48	VAS 5.40 $\pm$ 2.8	2.10 $\pm$ 2.30
			Stretching on land; 30 min; 2 $\times$ per week	10	51	VAS 5.80 $\pm$ 1.90	3.60 $\pm$ 2.00
Kell et al. (2009) [87]	Low back pain	16	Usual care control	9	41	VAS 4.40 $\pm$ 2.90	4.40 $\pm$ 3.20
			Aerobic training; 30 min; 3 $\times$ per week	9	36.7	VAS 5.10 $\pm$ 0.80	4.80 $\pm$ 0.80
			Resistance training; 30 min; 3 $\times$ per week	9	40.1	VAS 5.40 $\pm$ 0.90	3.30 $\pm$ 0.50
			True control	9	35.3	VAS 4.90 $\pm$ 0.60	4.80 $\pm$ 0.70

Table 1 (continued)

Study	Primary musculoskeletal condition	Study duration (weeks)	Group allocation	N	Mean age (years)	Baseline pain (mean $\pm$ SD)	Follow up pain (mean $\pm$ SD)
Kell et al. (2011) [88]	Low back pain	13	Resistance training (2D); unspecified session duration; 2 $\times$ per week	60	42.8	VAS 5.79 $\pm$ 0.88	4.96 $\pm$ 1.03
			Resistance training (3D); unspecified session duration; 3 $\times$ per week	60	41.7	VAS 5.80 $\pm$ 1.00	4.77 $\pm$ 1.00
			Resistance training (4D); unspecified session duration; 4 $\times$ per week	60	42.4	VAS 6.05 $\pm$ 0.90	4.35 $\pm$ 0.95
Kofotolis et al. (2006) [89]	Low back pain	4	Usual care control	60	43.2	VAS 5.83 $\pm$ 0.60	5.70 $\pm$ 0.86
			Resistance training (rhythmic); 30–45 min; 5 $\times$ per week	28	40.6	NRS 2.20 $\pm$ 0.80	1.40 $\pm$ 0.40
			Resistance training (isotonic); 30–45 min; 5 $\times$ per week	28	41.8	NRS 2.30 $\pm$ 0.50	1.40 $\pm$ 0.50
Masharawi et al. (2013) [90]	Low back pain	4	True control	30	42.14	NRS 1.90 $\pm$ 0.60	1.60 $\pm$ 0.40
			Resistance training; 45 min; 2 $\times$ per week	20	52.5	VAS 4.00 $\pm$ 1.43	1.68 $\pm$ 0.82
Oh et al. (2014) [92]	Low back pain	8	True control	20	53.6	VAS 3.91 $\pm$ 1.64	3.88 $\pm$ 1.54
			Resistance training (horse riding simulation); 10 min; 5 $\times$ per week	10	20.6	VAS 3.78 $\pm$ 0.49	1.44 $\pm$ 0.44
			Resistance training (horse riding simulation); 20 min; 5 $\times$ per week	9	20.3	VAS 4.89 $\pm$ 0.51	1.11 $\pm$ 0.11
			Resistance training (horse riding simulation); 30 min; 5 $\times$ per week	9	20.4	VAS 5.56 $\pm$ 0.71	3.44 $\pm$ 1.04
Schinhan et al. (2016) [94]	Low back pain	8	True control	9	20.7	VAS 3.10 $\pm$ 0.60	3.80 $\pm$ 0.87
			Resistance training (rock climbing); 60 min; 1 $\times$ per week	15	26.7	VAS 3.57 $\pm$ 1.81	1.23 $\pm$ 1.29
Segal-Snir et al. (2016) [93]	Low back pain	4	Usual care control	15	29.1	VAS 3.57 $\pm$ 1.74	2.87 $\pm$ 1.78
			Resistance training (group class); 40 min; 2 $\times$ per week	20	57.2	VAS 7.00 $\pm$ 2.30	7.00 $\pm$ 3.00
			True control	15	54.7	VAS 8.00 $\pm$ 1.40	7.00 $\pm$ 1.90

Table 1 (continued)

Study	Primary musculoskeletal condition	Study duration (weeks)	Group allocation	N	Mean age (years)	Baseline pain (mean $\pm$ SD)	Follow up pain (mean $\pm$ SD)
Shaughnessy et al. (2004) [100]	Low back pain	10	Resistance training; week 1: 2 $\times$ 1 h session, week 2: 2 $\times$ 30 min sessions, weeks 3–6, 8 and 10: 1 $\times$ 30 min session	20	43	SF-36 31.00 $\pm$ 12.00	46.00 $\pm$ 12.00
Steele et al. (2013) [98]	Low back pain	12	True control	21	46	SF-36 32.00 $\pm$ 13.00	28.00 $\pm$ 14.00
			Resistance training; 1 $\times$ set ILEX training until failure, unspecified session duration; 1 $\times$ per week	17	47	VAS 4.73 $\pm$ 2.41	2.37 $\pm$ 2.41
Turner et al. (1990) [118]	Low back pain	8	Usual care control	7	42	VAS 1.92 $\pm$ 1.55	2.95 $\pm$ 1.55
			Aerobic training; 20 min; 5 $\times$ per week	19	44	MPQ 19.42 $\pm$ 10.62	17.52 $\pm$ 10.20
Williams et al. (2009) [51]	Low back pain	24	True control	21	44	MPQ 21.17 $\pm$ 8.84	20.95 $\pm$ 10.62
			Mindful exercise (Yoga); 90 min; 2 classes $\times$ per week, 1 $\times$ per day at home	43	48.4	VAS 41.90 $\pm$ 16.00	24.30 $\pm$ 17.90
Yoo et al. (2014) [99]	Low back pain	8	Usual care control	47	47.6	VAS 41.20 $\pm$ 18.30	36.90 $\pm$ 19.80
			Resistance training (horse riding simulator); 10–40 min; 3 $\times$ per week	24	20.4	VAS 4.37 $\pm$ 2.13	2.22 $\pm$ 2.15
Zadro et al. (2019) [101]	Low back pain	8	True control	23	20.7	VAS 1.50 $\pm$ 0.51	1.00 $\pm$ 0.00
			Aerobic training (video game: Wii Fit U); 60 min; 3 $\times$ per week	30	68.8	NRS 5.20 $\pm$ 1.60	3.80 $\pm$ 2.40
De Araujo Cazotti et al. (2018) [102]	Neck pain	12	Usual care control	28	67.8	NRS 4.80 $\pm$ 1.70	4.40 $\pm$ 2.30
			Mindful exercise (Pilates); 60 min; 2 $\times$ per week	32	48.6	VAS 6.40 $\pm$ 1.67	1.30 $\pm$ 1.66
Falla et al. (2013) [103]	Neck pain	8	Usual care control	32	49	VAS 5.75 $\pm$ 1.64	5.47 $\pm$ 2.09
			Resistance training (neck exercise); 30 min; 1 $\times$ per week	22	39.1	VAS 5.30 $\pm$ 2.80	3.60 $\pm$ 2.80
			Usual care control	20	38.6	VAS 5.10 $\pm$ 2.00	4.80 $\pm$ 2.00

Table 1 (continued)

Study	Primary musculoskeletal condition	Study duration (weeks)	Group allocation	N	Mean age (years)	Baseline pain (mean $\pm$ SD)	Follow up pain (mean $\pm$ SD)
Rendant et al. (2011) [48]	Neck pain	24	Mindful exercise (Qigong); 90 min; 1 $\times$ per week (first 3 months), 2 $\times$ per week (second 3 months)	42	44.7	VAS 5.77 $\pm$ 1.35	2.67 $\pm$ 3.03
			Resistance training and stretching; unspecified session duration; 1 $\times$ per week (first 3 months), 2 $\times$ per week (second 3 months)	39	44.4	VAS 5.75 $\pm$ 1.55	2.74 $\pm$ 1.80
Viljanen et al. (2003) [107]	Neck pain	12	True control	41	47.8	VAS 5.34 $\pm$ 1.32	4.10 $\pm$ 2.07
			Resistance training; 30 min; 3 $\times$ per week	116	44	VAS 4.80 $\pm$ 2.30	2.90 $\pm$ 2.60
von Trott et al. (2009) [104]	Neck pain	24	True control	125	45	VAS 4.10 $\pm$ 2.20	2.70 $\pm$ 2.50
			Mindful exercise (Qigong); 45 min, 2 $\times$ per week	38	75.9	VAS 56.40 $\pm$ 19.40	53.10 $\pm$ 30.60
			Resistance training and stretching; 45 min, 2 $\times$ per week	39	76	VAS 47.10 $\pm$ 19.60	47.70 $\pm$ 30.50
Saeterbakken et al. (2017) [106]	Neck and shoulder pain	10	Usual care control	40	75.7	VAS 49.90 $\pm$ 20.30	59.90 $\pm$ 25.50
			Aerobic training (Nordic walking); 30 min; 2 $\times$ per week	9	41	VAS 2.59 $\pm$ 1.71	1.40 $\pm$ 1.08
			Resistance training; 30 min; 2 $\times$ per week	12	47.6	VAS 3.17 $\pm$ 1.89	1.63 $\pm$ 1.18
Buttagat et al. (2016) [105]	Scapulocostal syndrome (SCS)	6	True control	10	50.3	VAS 2.54 $\pm$ 2.12	2.00 $\pm$ 1.66
			Resistance training; 30 min; 3 $\times$ per week	18	20	VAS 5.78 $\pm$ 1.59	0.94 $\pm$ 1.47
Vincent et al. (2019) [115]	Knee osteoarthritis	17	True control	18	21.2	VAS 5.61 $\pm$ 1.33	4.39 $\pm$ 2.77
			Concentric resistance exercise training; 8 exercise, 2 $\times$ per week	17	69.5	WOMAC 5.90 $\pm$ 3.20	3.94 $\pm$ 3.20
			Eccentric resistance training; 8 exercise, 2 $\times$ per week	19	66.8	WOMAC 6.20 $\pm$ 2.80	3.42 $\pm$ 3.20
Rezasoltani et al. (2020) [114]	Knee osteoarthritis	4	Usual care control	17	68.6	WOMAC 5.30 $\pm$ 3.20	5.06 $\pm$ 3.20
			Aquatic cycling; 50 min; 3 $\times$ per week	15	50.8	KOOS 54.80 $\pm$ 1.3	80.80 $\pm$ 1.8
			Usual care control	15	51.2	KOOS 55.7 $\pm$ 3.3	55.30 $\pm$ 3.5

Table 1 (continued)

Study	Primary musculoskeletal condition	Study duration (weeks)	Group allocation	N	Mean age (years)	Baseline pain (mean $\pm$ SD)	Follow up pain (mean $\pm$ SD)
Abbott et al. (2013) [45]	Hip or knee osteoarthritis	52	Aerobic training; 9 $\times$ supervised 50 min sessions, 3 $\times$ per week home sessions of unspecified duration	51	66.9	VAS 3.50 $\pm$ 2.00	3.45 $\pm$ 2.00
Fransen et al. (2007) [78]	Hip or knee osteoarthritis	12	Usual care control	51	66.1	VAS 3.10 $\pm$ 2.00	2.75 $\pm$ 2.00
			Hydrotherapy; 60 min; 2 $\times$ per week	55	70	WOMAC 38.20 $\pm$ 17.40	27.30 $\pm$ 18.70
			Mindful exercise (Tai Chi); 60 min; 2 $\times$ per week	56	70.8	WOMAC 40.30 $\pm$ 19.00	30.70 $\pm$ 18.90
French et al. (2013) [70]	Hip osteoarthritis	9	True control	41	69.6	WOMAC 44.40 $\pm$ 17.00	40.00 $\pm$ 16.20
			Aerobic and resistance training; 30 min resistance training session 1 $\times$ per week; 30 min aerobic training at home 5 $\times$ per week	43	61.8	NRS 4.42 $\pm$ 3.24	3.21 $\pm$ 2.93
			True control	45	60.8	NRS 4.69 $\pm$ 3.24	5.13 $\pm$ 3.57
Harris-Hayes et al. (2016) [82]	Hip joint pain	6	Mindful exercise training (movement pattern); 60 min 1 $\times$ per week (session), daily home-based activities of unspecified duration	16	27.2	HOOS 78.20 $\pm$ 12.30	81.50 $\pm$ 13.20
Hinman et al. (2007) [77]	Hip & knee osteoarthritis	6	True control	16	29	HOOS 73.90 $\pm$ 13.80	75.80 $\pm$ 13.40
			Hydrotherapy; 45-60 min; 2 $\times$ per week	36	63.3	VAS 6.00 $\pm$ 2.00	4.00 $\pm$ 2.00
Fukuda et al. (2010) [79]	Patellofemoral pain syndrome	4	Usual care control	35	61.5	VAS 5.00 $\pm$ 2.00	5.00 $\pm$ 2.00
			Resistance training and stretching (knee and hip); unspecified session duration; 3 $\times$ per week	21	25	NRS 5.05 $\pm$ 1.59	2.65 $\pm$ 1.67
Khayambashi et al. (2012) [80]	Patellofemoral pain	8	Resistance training and stretching (knee); unspecified session duration; 3 $\times$ per week	20	25	NRS 4.70 $\pm$ 2.82	3.45 $\pm$ 2.37
			True control	23	24	NRS 4.65 $\pm$ 2.44	4.55 $\pm$ 2.42
			Resistance training; 30 min; 3 $\times$ per week	14	29.9	VAS 7.90 $\pm$ 1.70	1.40 $\pm$ 1.90
			Placebo oral supplement; daily	14	30.5	VAS 6.60 $\pm$ 2.00	6.70 $\pm$ 2.40

Table 1 (continued)

Study	Primary musculoskeletal condition	Study duration (weeks)	Group allocation	N	Mean age (years)	Baseline pain (mean $\pm$ SD)	Follow up pain (mean $\pm$ SD)
Saad et al. (2018) [81]	Patellofemoral pain	8	Resistance training (hip); 50 min; 2 $\times$ per week	10	22.5	VAS 5.05 $\pm$ 1.27	0.55 $\pm$ 0.80
			Resistance training (quadriceps); 50 min; 2 $\times$ per week	10	23.2	VAS 6.34 $\pm$ 1.85	0.56 $\pm$ 0.89
			Stretching; 50 min; 2 $\times$ per week	10	21.3	VAS 4.08 $\pm$ 0.82	0.14 $\pm$ 0.25
An et al. (2008) [67]	Knee osteoarthritis	8	True control	10	23.2	VAS 4.03 $\pm$ 1.03	3.69 $\pm$ 0.60
			Mindful exercise (Baduajin); 30 min; 5 $\times$ per week	11	65.4	WOMAC 150.00 $\pm$ 99.70	71.10 $\pm$ 110.10
Aglamis et al. (2008) [66]	Knee osteoarthritis	12	True control	10	64.6	WOMAC 116.80 $\pm$ 74.50	138.20 $\pm$ 112.60
			Aerobic and resistance training; unspecified session duration; 3 $\times$ per week	16	56.8	VAS 4.40 $\pm$ 1.90	0.70 $\pm$ 1.00
Borjesson et al. (1996) [68]	Knee osteoarthritis	12	True control	9	54.4	VAS 6.20 $\pm$ 3.40	7.70 $\pm$ 2.30
			Resistance training; 40 min; 3 $\times$ supervised sessions per week, 2 $\times$ unsupervised sessions per week	34	64	VAS 3.40 $\pm$ 2.00	3.00 $\pm$ 1.50
Cheing et al. (2002) [69]	Knee osteoarthritis	4	True control	34	64	VAS 3.30 $\pm$ 1.40	3.30 $\pm$ 1.50
			Resistance training; 30 min; 5 $\times$ per week	15	60.9	VAS 10.00 $\pm$ 0.0	7.07 $\pm$ 5.97
Cheung et al. (2014) [49]	Knee osteoarthritis	8	Placebo control (TENS stimulation); 60 min; 5 $\times$ per week	16	64.1	VAS 10.00 $\pm$ 0.0	5.67 $\pm$ 3.63
			Mindful exercise (Yoga); unspecified session duration; 1 $\times$ class per week, 4 $\times$ home sessions per week	18	71.9	WOMAC 9.30 $\pm$ 4.00	5.80 $\pm$ 2.68
			Usual care control	18	71.9	WOMAC 7.70 $\pm$ 4.20	8.30 $\pm$ 2.84

Table 1 (continued)

Study	Primary musculoskeletal condition	Study duration (weeks)	Group allocation	N	Mean age (years)	Baseline pain (mean $\pm$ SD)	Follow up pain (mean $\pm$ SD)
Lim et al. (2008) [72]	Knee osteoarthritis (medial)	13	Resistance training; 7 $\times$ physiotherapist sessions; unspecified session duration; 5 $\times$ per week	26	67.2	WOMAC 33.10 $\pm$ 15.40	28.50 $\pm$ 16.90
			Resistance training (neutral); 7 $\times$ physiotherapist sessions; unspecified session duration; 5 $\times$ per week	27	64.1	WOMAC 35.70 $\pm$ 14.60	22.80 $\pm$ 16.90
			True control	26	66.6	WOMAC 39.20 $\pm$ 14.00	36.20 $\pm$ 16.20
			True control (neutral)	28	60.8	WOMAC 34.60 $\pm$ 16.20	33.60 $\pm$ 15.40
Lin et al. (2009) [73]	Knee osteoarthritis	8	Resistance training; unspecified session duration; 3 $\times$ per week	36	61.6	WOMAC 8.80 $\pm$ 3.60	4.20 $\pm$ 3.00
			Mindful exercise (computer game); 20 min each leg; 3 $\times$ per week	36	63.7	WOMAC 8.00 $\pm$ 3.70	4.30 $\pm$ 2.30
Lund et al. (2008) [50]	Knee osteoarthritis	8	True control	36	62.2	WOMAC 8.50 $\pm$ 4.60	7.30 $\pm$ 3.40
			Hydrotherapy; 50 min; 2 $\times$ per week	27	65	VAS 2.98 $\pm$ 2.35	2.03 $\pm$ 1.66
			Resistance and stretching; 50 min; 2 $\times$ per week	25	70	VAS 2.33 $\pm$ 1.88	1.88 $\pm$ 1.65
			Usual care control	27	68	VAS 1.55 $\pm$ 2.01	2.72 $\pm$ 1.66
Jan et al. (2008) [71]	Knee osteoarthritis	8	Resistance training (low); 30 min; 3 $\times$ per week	34	63.3	WOMAC 7.80 $\pm$ 3.30	4.80 $\pm$ 2.70
			Resistance training (high); 50 min; 3 $\times$ per week	34	61.8	WOMAC 8.50 $\pm$ 3.80	4.80 $\pm$ 3.50
			True control	30	62.8	WOMAC 8.30 $\pm$ 4.60	7.10 $\pm$ 3.40
Rosedale et al. (2014) [74]	Knee osteoarthritis	2	Aerobic and resistance training; 60 min initial session, 20 min follow-up sessions; 4–6 $\times$ per week	39	64	KOOS 54.00 $\pm$ 17.00	70.00 $\pm$ 16.00
			Resistance training; 60 min initial session, 20 min follow-up sessions; 4–6 $\times$ per week	54	68	KOOS 49.00 $\pm$ 17.00	52.00 $\pm$ 18.00
			Usual care control	53	64	KOOS 46.00 $\pm$ 17.00	45.00 $\pm$ 17.00

Table 1 (continued)

Study	Primary musculoskeletal condition	Study duration (weeks)	Group allocation	N	Mean age (years)	Baseline pain (mean $\pm$ SD)	Follow up pain (mean $\pm$ SD)
Schilke et al. (1996) [75]	Knee osteoarthritis	8	Resistance training; unspecified session duration; 3 $\times$ per week	10	64.5	OASI 15.80 $\pm$ 4.88	9.70 $\pm$ 4.72
Wang et al. (2011) [76]	Knee osteoarthritis	12	Usual care control	10	68.4	OASI 9.70 $\pm$ 6.73	10.10 $\pm$ 6.44
			Hydrotherapy; 60 min; 3 $\times$ per week	26	66.7	KOOS 61.00 $\pm$ 20.00	72.00 $\pm$ 18.00
			Aerobic training and stretching; 60 min; 3 $\times$ per week	26	68.3	KOOS 65.00 $\pm$ 14.00	76.00 $\pm$ 15.00
Osteras et al. (2014) [109]	Hand osteoarthritis	12	True control	26	67.9	KOOS 66.00 $\pm$ 18.00	68.00 $\pm$ 18.00
			Resistance training and stretching; unspecified session duration; group training sessions in weeks 1–3; 3 $\times$ per week at home	65	67	NRS 4.20 $\pm$ 2.10	3.70 $\pm$ 2.10
			Usual care control	65	65	NRS 3.90 $\pm$ 1.80	4.40 $\pm$ 2.00
Horstmann et al. (2013) [108]	Achilles tendinopathy	12	Resistance training; unspecified session duration; 3 $\times$ per week	19	45.7	VAS 48.13 $\pm$ 33.87	14.87 $\pm$ 23.61
			True control	16	44.4	VAS 34.87 $\pm$ 33.69	32.10 $\pm$ 31.18
Ferrell et al. (1997) [83]	Musculoskeletal pain	6	Aerobic training (walking) and stretching; 25–55 min; 4 $\times$ per week	9	72.3	PPQ 60.30 $\pm$ 26.60	36.40 $\pm$ 25.60
			Usual care control	9	72.7	PPQ 47.20 $\pm$ 29.70	55.90 $\pm$ 21.00

FIQ Fibromyalgia Impact Questionnaire, pain subscale, *HOOS* Hip Disability and Osteoarthritis Outcome Score, pain subscale, *KOOS* Knee Injury and Osteoarthritis Outcome Score, pain subscale, *NRS* Numerical Rating Scale, pain intensity, *OASI* Osteoarthritis Screening Index, pain subscale, *PPQ* Patient Pain Questionnaire, *SF-36* Short Form 36, bodily pain, *TP* Tender Points, total survey site score, *VAS* Visual Analogue Scale, pain intensity, *WOMAC* Western Ontario and McMaster Universities Osteoarthritis Index, pain subscale, *MPQ-PRI* McGill Pain Questionnaire, pain rating index, *MPQ-PPI* McGill Pain Questionnaire, present pain intensity

Table 2 should be replaced by the following version:

Table 2 Summary of findings for treatment comparisons

Group 1	Group 2	Studies	<i>n</i>	Hedges' <i>g</i> (95%CI)	<i>P</i> value	<i>I</i> ² (%)	Low ROB (%)	Egger's <i>P</i>	GRADE*
INT: All	CON: Placebo	4	253	0.94 (−0.17, 2.06)	0.098	92.46%	0%	0.250	Very low (a, b, c)
INT: All	CON: All	79	4843	0.84 (0.64, 1.04)	< 0.001	90.02%	0%	< 0.001	Very low (a, b, d)
INT: All	CON: True	42	2361	0.99 (0.66, 1.32)	< 0.001	92.43%	0%	< 0.001	Very low (a, b, d)
INT: All	CON: Usual care	33	2229	0.64 (0.44, 0.83)	< 0.001	76.52%	0%	< 0.001	Very low (a, b, d)

CON control, INT sole exercise training intervention, 95% CI 95% confidence interval, ROB risk of bias (percentage of studies with low).

GRADE certainty ratings: *very low* the true effect is likely markedly different from the estimated effect; *low* the true effect might be markedly different from the estimated effect; *moderate* the true effect is likely close to the estimated effect; *high* the true effect is likely similar to the estimated effect

*a—certainty rated down two grades based on all studies having a high overall risk of bias, b—certainty rated down one grade based on unexplained statistical inconsistency ($I^2 \geq 76.52\%$), c—certainty rated down one grade based on imprecision due to width of 95% CI (−0.17, 2.06), d—certainty rated down one grade based on publication bias (Egger's $P < 0.05$) [40]

Figure 3 should be replaced by the following version:

Figure 4 should be replaced by the following version:

Fig. 3 Forest plot for the meta-analysis investigating the effectiveness of exercise training versus placebo comparators for reducing musculoskeletal pain. Horizontal lines represent standardised mean differ-

ence (Hedges' *g*) and 95% confidence intervals. The size of the box represents the weight of each study. The diamond represents the overall estimated effect. INT intervention group, CON control group

Fig. 4 Forest plot for the meta-analysis investigating the effectiveness of exercise training versus all control comparators for reducing musculoskeletal pain. Horizontal lines represent standardised mean difference (Hedges' g) and 95% confidence intervals. The size of the box represents the weight of each study. The diamond represents the overall estimated effect. *INT* intervention group, *CON* control group

Figure 5 should be replaced by the following version:

Fig. 5 Forest plot for the meta-analysis investigating the effectiveness of exercise training versus true control comparators for reducing musculoskeletal pain. Horizontal lines represent standardised mean difference (Hedges' *g*) and 95% confidence intervals. The size of the box represents the weight of each study. The diamond represents the overall estimated effect. *INT* intervention group, *CON* control group

Figure 6 should be replaced by the following version:

Fig. 6 Forest plot for the meta-analysis investigating the effectiveness of exercise training versus usual-care control comparators for reducing musculoskeletal pain. Horizontal lines represent standardised mean difference (Hedges' g) and 95% confidence intervals. The size of the box represents the weight of each study. The diamond represents the overall estimated effect. *INT* intervention group, *CON* control group

The original article has been updated.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s40279-021-01578-8>.