

e-Appendix 1: keywords databases search:

- #1 Lung Diseases, Obstructive/
- #2 exp Pulmonary Disease, Chronic Obstructive/
- #3 (chronic\$ adj3 bronchiti\$).mp
- #4 (obstruct\$ adj3 (pulmonary or lung\$ or airway\$ or airflow\$ or bronch\$ or respirat\$)).mp
- #5 COPD.mp
- #6 COAD.mp
- #7 COBD.mp
- #8 Exp. Chronic, Bronchitis
- #9 Exp. Lung Diseases, Obstructive
- #10 #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9
- #11 Exp. intervention studies/
- #12 Exp. Therapeutic/
- #13 Treat*.mp.
- #14 Therap*.mp.
- #15 Habilitation.mp.
- #16 Treatment\$
- #17 Intervention\$
- #18 Therapeutic\$
- #19 Manag*.mp.
- #20 #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19
- #21 Exp. "physical activity"
- #22 Exp. "Motor Activit*"
- #23 Exp. "Locomotor Activit*"
- #24 Activit*.mp.
- #25 Exp. Physical Endurance\$
- #26 Train*.mp.
- #27 #21 or #22 or #23 or #24 or #25 or #26
- #28 "Qualit* of life"
- #29 (Qualit* adj2 life)
- #30 "Activit* of daily living"
- #31 (Activit* adj3 living)
- #32 ADL.mp.
- #33 #28 or #29 or 30 or 31 or 32 or 33
- #34 #10 and #20 and #27 and #33

e-Appendix 2: data extraction form:

First author	Year	Title	Publication source

Study eligibility

Relevant studies	Relevant participants	Relevant interventions	Relevant outcomes
Yes - no - unclear	Yes - no - unclear	Yes - no - unclear	Yes - no - unclear

Participants characteristics

Number of participants enrolled	
Number of participants followed-up	
Number of participants diagnosed with COPD	
Number of participants diagnosed with other respiratory disease	
Age (range or average) in years	
Participants gender	Male:
	Female:

trial characteristics

Randomized control trials in title	Concealed allocation	Blinding assessor
Yes – no	Yes – no	Yes – no
Describe the method of randomization		

Outcome measurement characteristics

Primary outcome measurements	
Participation in physical activity	Yes – no
Objective assessment	Yes – no
Subjective assessment (self-reported quality of life questionnaires)	Yes – no
Secondary outcome measurements	
Exercise capacity	Yes – no
Adverse outcomes	Yes – no
Pulmonary function test	
FEV ₁	Yes – no
FVC	Yes – no
Quality of life assessment	Yes – no
Dyspnea	Yes – no

Other relevant information in the results

Additional outcomes published in paper but not listed above

Main conclusion of trial

References to trial

Check other references identified in searches. If there are further references to this trial link the papers now & list below.

Code each paper	Author(s)	Journal/conference proceedings etc	Year
A (this paper)			
B (others)			

e-Appendix 3: primary outcomes:

Online Table S1: studies comparing physical activity interventions versus usual care (or placebo).

Study	Intervention	Control	Outcome (Unit)	Time Point	Intervention arm		Control arm		Effect Size [95% Confidence Interval]
					n	Mean (SD)	n	Mean (SD)	
Berry 2003	Maintenance ET	UC	PASE activity score	15M	62	115.8 (61.9)	56	111.6 (63.6)	0.07 [-0.29-0.43]
Borges 2014	Whole-body ET (average of 5.6 sessions)	UC	Daily walking (min)	1M post-discharge	15	30.9 (21)	14	49.7 (35)	-0.64 [-1.39-0.11]
			Daily standing (min)	1M post-discharge	15	167.8 (104)	14	153 (94)	0.14 [-0.58-0.87]
			Daily sitting (min)	1M post-discharge	15	286.7 (122)	14	298 (107)	-0.09 [-0.82-0.63]
			Daily lying (min)	1M post-discharge	15	223.8 (131)	14	203.2 (140)	0.00 [-0.72-0.73]
Breyer 2010	Nordic walking	UC	Δ daily movement intensity (m/s ²)	3M	30	1.98 (0.62)	30	1.47 (0.27)	1.05 [0.51-1.59]
				6M	30	1.85 (0.55)	30	1.50 (0.43)	0.70 [0.18-1.22]
				9M	30	1.81 (0.48)	30	1.39 (0.32)	1.02 [0.48-1.56]
Dal Negro 2010 and 2012	EAAs	Placebo	Daily steps (n)	Δ 1M		880 (837)		651.8 (558)	NS
				Δ 3M		1140 (525)		562.8 (602)	p=0.02
			Daily energy expenditure (Kcal /step/FFM*Kg)	1M		1.9 (0.85)		1.26 (0.7)	P<0.03
				3M		3.2 (1.7)		0.9 (0.5)	p<0.005
Faulkner 2010	Supervised ET	UC	7 days PA recall questionnaire score (Kcal)	9W	6	14311 (793)	8	14170 (728)	0.17 [-0.89-1.24]
Goris 2003	Respifor®	UC	Daily PA levels (arbitrary units)	1M post discharge	11	1.58 (0.07)	9	1.56 (0.07)	0.27 [-0.61- 1.16]
				3M post discharge	11	1.60 (0.29)	9	1.54 (0.08)	0.25 [-0.66- 1.17]
			Daily energy expenditure (megajoule)	1M post discharge	11	8.8 (1.6)	9	9.4 (1.9)	-0.33 [-1.22-0.56]
				3M post discharge	11	9.0 (2.5)	9	8.5 (1.7)	0.22 [-0.70- 1.13]

Hornikx 2015	PA counselling	UC	Daily steps (n)	Δ1M	15	984 (1208)	15	1013 (1275)	-0.02 [-0.74-0.69]
			Daily walking (min)	Δ1M	15	13 (16)	15	13 (14)	0.00 [-0.72-0.72]
			Daily movement intensity m/s ²	Δ1M	15	0.08 (0.06)	15	0.06 (0.05)	0.5 [-0.37-1.07]
Hospes 2009	Exercise counselling	UC	Daily steps (n)	12W	18	7872 (3962)	17	6172 (3194)	0.46 [-0.21- 1.13]
Jonsdottir 2015	Self-management	UC	IPAQ total (MET-min/W)	12M	43	6.72 (2.43)	46	6.00 (2.35)	0.30 [-0.12-0.72]
			IPAQ vigorous (MET-min/W)	12M	47	4.00 (3.58)	51	2.71 (3.25)	0.38 [-0.02-0.78]
			IPAQ moderate (MET-min/W)	12M	47	5.3 (2.88)	52	4.17 (3.09)	0.37 [-0.02-0.77]
			IPAQ walking (MET-min/W)	12M	47	3.87 (2.89)	52	3.62 (2.88)	0.09 [-0.31-0.48]
Kruis 2014 (clustered RCT)	Integrated disease management	UC	IPAQ total (MET min/day)	Δ12M	554	-44 (5175)	532	-438 (5278)	0.08 [-0.04-0.20]
			IPAQ high/moderate (%)	Δ12M	554	32.2	532	22.1	P<0.001
Larson 2014	Self-efficacy	UC	Daily MVPA (min)	4M	15	6 (6)	14	3 (2)	0.64 [-0.11-1.39]
			Daily LPA (min)	4M	15	256 (83)	14	196 (66)	0.77 [0.02-1.53]
			Daily sedentary (min)	4M	15	602 (112)	14	634 (114)	-0.28 [-1.01-0.46]
Sandland 2008	Cylinder O ₂	Cylinder placebo	Daily activity counts	8W	10	6912.1 (4171.2)	10	5999.6 (3.807.9)	0.30 [-0.59-1.18]
Schüz 2015	Health monitoring	UC	Daily steps (n)	6M	55	5360.45 (2963)	83	4547.7 (2485)	0.30 [-0.04-0.59]
				12M	73	4770.2 (2975.5)	47	4708.7 (2389.4)	0.02 [-0.34-0.39]
Steele 2008	Exercise adherence after PR	UC after PR	Daily PA activity (VMU)	Δ20W	42	18 (55)	47	-2 (66)	0.32 [-0.09-0.74]
				Δ12M	31	6 (75)	39	-11 (62)	0.25 [-0.23-0.72]
			SR daily exercise (min)	Δ20W	42	3 (39)	47	-13 (26)	0.48 [0.06-0.91]
				Δ12M	31	1 (45)	39	-8 (31)	0.24 [-0.24-0.71]
Watz 2014 (crossover RCT)	Indacaterol 150µg	Placebo	Daily steps (n)	3W	83	7341 (2312.5)	83	6618 (2119.5)	0.32 [0.02-0.63]
			Daily MVPA (min)	3W	83	125 (90.6)	83	97 (83.7)	0.32 [0.01-0.63]
			Daily PA (total EE/ resting EE)	3W	83	1.61 (0.23)	83	1.54 (0.21)	0.36 [0.05-0.67]
Wilson 2015	PR Maintenance	UC	IPAQ total (MET-min/W)	Δ12M	16	134.38 (518.16)	17	-88.82 (407.53)	0.47 [-0.22-1.16]

			VAS	Δ 12M	17	11.35 (18.92)	18	-4.88 (14.25)	0.95 [0.25-1.65]
--	--	--	-----	--------------	----	------------------	----	------------------	------------------

ET: Exercise Training, UC: Usual Care, EAA: Essential Amino Acids, PR: Pulmonary Rehabilitation, M: Month/s, W: Week/s, Δ : Change from Baseline, PA: Physical Activity, IPAQ: International Physical Activity Questionnaire, EE: Energy Expenditure, METs: Metabolic Equivalent Task, SR: Self-Reported, VAS: Visual Activity Scale, VMU: Vector Magnitude Units.

Online Table S2: studies comparing physical activity interventions added to PR versus PR alone.

Study Name	Intervention	Control	Outcome (Unit)	Time Point	Intervention arm		Control arm		Effect Size [95% Confidence Interval]
					n	Mean (SD)	n	Mean (SD)	
Altenburg 2014	PA counselling + PR	PR	Daily steps (n)	Δ3M	22	547 (841.5)	15	-211 (1759.3)	0.58 [-0.10-1.25]
				Δ15M	10	-569 (3009.6)	13	-1137 (2817)	0.19 [-0.64-1.02]
			Daily steps equivalent (energy cost in steps) (n)	Δ3M	22	1302 (1552)	15	-849 (2358.5)	1.10 [0.39-1.81]
				Δ15M	10	-213 (5036.3)	13	-1827 (3088)	0.39 [-0.42-1.20]
Burtin 2015	PA counselling + PR	PR	Daily steps (n)	Δ3M	30	576 (2649.4)	31	394 (845)	0.09 [-0.41-0.59]
				Δ6M	28	-78 (2741)	22	454 (662.2)	-0.25 [-0.81-0.31]
			Daily walking time (min)	Δ3M	30	-0.6 (23.9)	31	2 (12.1)	-0.14 [-0.64-0.37]
				Δ6M	28	2 (8.8)	22	3 (40.4)	-0.04 [-0.59-0.52]
			Daily MVPA (>3.6 METs)	Δ3M	30	1.4 (27.6)	31	2 (23.5)	-0.02 [-0.53-0.48]
				Δ6M	28	-6.5 (23.9)	22	0 (11.1)	-0.33 [-0.89-0.23]
			Daily MVPA (>2.0 METs)	Δ3M	30	0 (70.5)	31	12 (25)	-0.23 [-0.73-0.28]
				Δ6M	28	-23 (28.6)	22	11 (23.2)	-1.27 [-1.88—0.65]
Cruz 2016	PA focused behavioral counselling + PR	PR	Daily steps (n)	3M	13	10440 (4012.9)	13	6430 (2613.1)	1.15 [0.31-1.99]
				6M	13	9747.9 (3511.8)	13	6481.3 (3454.4)	0.90 [0.08-1.71]
			Daily overall MVPA (>3.0 METs) (min)	3M	13	57.8 (32.8)	13	26.7 (19.6)	1.11 [0.28-1.95]
				6M	13	51.6 (29.4)	13	28.0 (26.0)	0.82 [0.02-1.63]
			Daily PA (≥ 1.5 METs) (min)	3M	13	279.5 (74.0)	13	212.0 (53.9)	1.01 [0.19-1.83]
				6M	13	269.3 (61.5)	13	202.9 (82.5)	0.88 [0.07-1.70]
			Daily MVPA bouts* (>3.0 METs, ≥ 30min) (min)	3M	13	23.3 (28.6)	13	4.3 (7.3)	0.88 [0.07-1.69]
				6M	13	20.3 (24.2)	13	3.8 (7.4)	0.89 [0.08-1.71]

			Daily sedentary (≤ 1.5 METs) (min)	3M	13	536.4 (86.6)	13	625.9 (93.3)	0.96 [0.14-1.78]
				6M	13	578.8 (102.8)	13	566.8 (116.5)	-0.11 [-0.88-0.66]
de Blok 2006	Lifestyle PA counselling + PR	PR	Daily steps (n)	9W	8	3512 (2474.9)	8	2832 (1878.2)	0.29 [-0.69-1.28]
Duiverman 2008	NIPPV + PR	PR	Daily steps (n)	$\Delta 3M$	31	906 (1062.2)	35	413 (1062.2)	0.46 [-0.03-0.95]
Kawagoshi 2015	Pedometer feedback during home-based PR	Home-based PR	Daily walking (min)	$\Delta 12M$	12	51.3 (63.7)	15	12.3 (25.5)	0.82 [0.02-1.61]
			Daily standing (min)	$\Delta 12M$	12	43.0 (28.1)	15	31.3 (46.8)	0.29 [-0.48-1.05]
			Daily sitting (min)	$\Delta 12M$	12	59.3 (103.3)	15	6.1 (90.1)	-0.54 [-1.13-0.24]
			Daily lying down time (min)	$\Delta 12M$	12	-52.9 (68.4)	15	-28.6 (55.1)	0.38 [-0.38-1.15]
Kesten 2008	Tiotropium + PR	Placebo + PR	Activity time questionnaire (min in 2W)	$\Delta W4-W13$	22	145 (294)	16	66 (384)	0.23 [-0.42-0.88]
				$\Delta W4-W17$	22	269 (295)	16	99 (424)	0.47 [-0.18-1.12]
				$\Delta W4-W21$	19	159 (252.8)	17	125 (445.3)	0.09 [-0.56-0.75]
				$\Delta W4-W25$	22	262 (450.3)	16	60 (372)	0.47 [-0.18-1.13]
Pleguezuelos 2013	Urban walking circuits + PR	PR	Daily walking (min)	12M	34	81.62 (31)	37	49.05 (14)	1.36 [0.84-1.88]
			Weekly days walked (n)	12M	34	4.44 (0.9)	37	3.43 (1.2)	0.90 [0.41-1.39]

*Continuous bouts of 30 minutes or more or in bouts of 10 minutes or more, ET: Exercise Training, PR: Pulmonary Rehabilitation, M: Month/s, W: Week/s, Δ : Change from Baseline, PA: Physical Activity, MVPA: Moderate to Vigorous Physical Activity, EE: Energy Expenditure, METs: Metabolic Equivalent Task. NIPPV: Non-Invasive Positive Pressure Ventilation.

Online Table S3: studies comparing physical activity interventions versus another physical activity intervention.

Study	Intervention	Control	Outcome (Unit)	Time Point	Intervention arm		Control arm		Effect Size [95% Confidence Interval]
					n	Mean (SD)	n	Mean (SD)	
Berry 2010	Lifestyle activity program	ET	CHAMPS-MVPA (Kcals/W)	3M	41	2497 (1366)	55	2497 (1418)	0.00 [-0.40-0.40]
				6M	41	2462 (1242)	53	2213 (1371)	0.19 [-0.22-0.60]
				12M	37	2348 (1399)	49	2217 (1552)	0.09 [-0.34-0.51]
Casaburi 2012	Lightweight ambulatory O2	E-Cylinder ambulatory O2	Mid-day PA from 10:00 am to 4:00 pm (VMU/min)	3M	11	133.6 (75.3)	11	81.4 (36)	0.85 [-0.03-1.73]
				6M	11	124.2 (73.8)	11	90.4 (45.1)	0.53 [-0.32-1.39]
Effing 2011	ET + Self-management	Self-management	Daily steps (n)	Δ7M	59	478.1 (2676.9)	52	-87.3 (2261.4)	0.23 [-0.15-0.60]
				Δ12M	55	815.6 (2659.4)	55	-374.8 (2272.3)	0.48 [0.10-0.86]
Mendoza 2015	Pedometer-based counselling	Standard counselling	Daily steps (n)	Δ3M	50	3080 (3254.8)	47	138.3 (1950.4)	1.08 [0.65-1.51]
Moy 2015	Internet-mediated pedometer-based program	Pedometer recording only	Daily steps (n)	Δ4M	133	447 (1817)	68	-346 (1949)	0.84 [0.59-1.08]
Nguyen 2009	Cell phone-mediated exercise persistence program	Cell phone-mediated self-monitoring program	Daily steps (n)	3M	9	5879 (3048)	8	4452 (3060.4)	0.44 [-0.52-1.14]
				6M	9	5675 (3021)	8	5383 (3023.5)	0.09 [-1.86-1.04]
			Daily % of sedentary time (0 steps/hour)	3M	9	70 (12.3)	8	73.8 (12.1)	0.30 [-0.66-1.25]
				6M	9	69.5 (12.3)	8	69.3 (12.3)	-0.02 [-0.97-0.94]
			Daily % of MVPA time (≥31 steps/min)	3M	9	24.2 (7.8)	8	18.6 (7.9)	0.68 [-0.31-1.66]
				6M	9	23.6 (7.8)	8	23.5 (8.2)	0.01 [-0.89-1.00]
Pomidori 2012		Home-based walking with	Daily METs (3.5ml/Kg.min)	6M	18	1.31 (0.16)	18	1.36 (0.22)	-0.25 [-0.19-0.40]

	Home-based walking with fixed speed	fixed distance		Δ12M	18	0.17 (0.14)	18	0.04 (0.13)	0.94 [0.25-1.63]
			Daily METs peak (3.5ml/Kg.min)	6M	18	1.46 (0.23)	18	1.48 (0.26)	-0.08 [-0.73-0.57]
				Δ12M	18	0.16 (0.20)	18	0.06 (0.13)	0.58 [-0.09-1.25]
			Total MVPA (>3METs) time in 7days (h)	6M	18	57 (51)	18	67 (46)	-0.20 [-0.86-0.45]
				Δ12M	18	35 (32)	18	13 (28)	0.72 [0.04-1.39]
Probst 2011	High intensity and whole-body ET	Light intensity and breathing ET	Daily steps (n)	12W	20	4179 (646.7)	20	4278.6 (796)	-0.13 [-0.76-0.49]
			Daily walking (min)	12W	20	52.7 (40.4)	20	43.5 (26.7)	0.26 [-0.36-0.89]
			Daily sitting (min)	12W	20	313.6 (110)	20	330.5 (122.7)	-0.14 [-0.76-0.48]
			Daily standing (min)	12W	20	241.1 (114.1)	20	226.2 (127)	0.12 [-0.50-0.74]
			Daily lying (min)	12W	20	93.4 (76.3)	20	112.7 (84.7)	-0.23 [-0.86-0.39]
			Daily activities cost >3METs (min)	12W	20	74 (18.7)	20	53.1 (16.4)	1.16 [0.49-1.84]
			Daily total EE (Kcal)	12W	20	1312.3 (119.4)	20	1347 (199)	-0.21 [-0.83-0.41]
			Daily activity cost>3METs EE (Kcal)	12W	20	408 (118.3)	20	343.8 (442.4)	0.19 [-0.43-0.82]
Sewell 2005	Individualized ET	General ET	Daily activity counts (%)	Δ7W	64	40.6 (135.5)	59	29.2 (101.8)	0.09 [-0.26-0.45]
Tabak 2014	Internet-mediated PA counselling	ET	Daily steps (n)	3W	14	5603 (3475.8)	16	4617 (3460)	0.28 [-0.46-1.01]
Troosters 2014	Tiotropium 18µg and PA counselling	Placebo and PA counselling	Daily steps (n)	24W		6481		6116	
			Daily age-appropriate MVPA (min)	24W		72.3		64.2	
			Light PA time (min)	24W		111.4 (81.7)		101.4 (79.9)	
Vergeret 1989	LTOT with portable O2	LTOT with fixed O2	Questionnaire-daily indoors rest time (h)	12M	84	12.8	75	12.8	NS
			Questionnaire-daily indoors activities time (h)	12M	84	9.3	75	9.3	NS

			Questionnaire-daily outdoors activities (h)	12M	84	1.8	75	1.6	NS
			Questionnaire-daily outdoors distance walked (m)	12M	84	480 (397)	75	520 (370)	-0.10 [-0.42-0.21]

ET: Exercise Training, METs: Metabolic Equivalent Tasks, MVPA: Moderate to Vigorous Physical Activity, EE: Energy Expenditure, M: Month/s, W: Week/s, SR: Self-reported, EDU: Education, Δ: change from baseline. min: minutes, h: hours. LTOT: Long Term Oxygen Therapy, CHAMPS: Community Healthy Activities Model Program for Seniors.

e- Appendix 4: secondary outcomes

Online Table S4: physical activity interventions effect on exercise capacity.

Study Name	Intervention	Control	Outcome (Unit)	Time Point	Intervention		Control		Effect Size [95%CI]
					n	Mean (SD)	n	Mean (SD)	
Studies comparing physical activity interventions versus usual care (or placebo)									
Berry 2003	Maintenance ET	UC	6MWD (ft)	6M	64	1830.6 (232.8)	52	1739.6 (112.3)	0.48 [0.11- 0.85]
				12M	60	1810.5 (228.7)	44	1708.6 (216.4)	0.45 [0.06- 0.85]
				15M	62	1815.0 (260.7)	56	1711.5 (270.7)	0.39 [0.02- 0.75]
Borges 2014	Whole-body ET (average of 5.6 sessions)	UC	Δ6MWD (m)	%Δdischarge	15	74.2 (118.9)	14	4.1 (7.48)	0.79 [0.03-1.56]
				%Δ1M post discharge	15	87.8 (116.9)	14	29.4 (65.9)	0.59 [-0.15-1.34]
Breyer 2010	Nordic walking	UC	6MWD (m)	3M	30	540 (159)	30	442 (133)	0.47 [-0.04- 0.98]
				6M	30	531 (142)	30	428 (138)	0.73 [0.20- 1.25]
				9M	30	519 (160)	30	422 (130)	0.66 [0.14- 1.18]
Faulkner 2010	Supervised ET	UC	ISWD (m)	9W	6	399 (172)	8	362 (125)	0.24 [-0.83- 1.30]
Hornikx 2015	PA counselling	UC	6MWD (m)	Δ1M	15	67 (84)	15	64 (59)	0.04 [-0.68-0.76]
Hospes 2009	Exercise counselling	UC	6MWD (m)	12W	18	387.4 (46.6)	17	361.4 (66.6)	0.46 [-0.21- 1.13]
Sandland 2008	Cylinder O ₂	Cylinder placebo	ISWD (m)	8W	10	251.1 (136.2)	10	211.1 (98.8)	0.32 [-0.56-1.21]
			ESWT (s)	8W	10	340 (336.1)	10	170.3 (97.5)	0.66 [-0.25-1.56]
Steele 2008	Exercise adherence after PR	UC after PR	6MWD (m)	Δ20W	42	-10.7 (63.1)	47	-35.4 (49.1)	0.44 [0.01- 0.86]
				Δ12M	31	-21(60.7)	39	-39.6 (65.5)	0.29 [-0.18- 0.76]
Wilson 2012	PR Maintenance	UC	ISWD (m)	Δ12M	40	-70.22 (487.59)	40	-179.29 (451.37)	0.23 [-0.21-0.67]
			ESWT (s)	Δ12M	40	-152.90 (430.32)	43	-142.84 (398.91)	-0.02 [-0.45-0.41]
Studies comparing physical activity interventions added to PR versus PR alone									
Altenburg 2014	PA counselling (12W) + PR (9W)	PR (9W)	6MWD (m)	3M	22	419 (47)	15	379 (81)	0.62 [-0.05-1.30]
				15M	10	409 (164)	13	449 (85)	-0.31 [-1.14-0.52]
Burtin 2015	PA counselling (6M) + PR (6M)	PR (6M)	6MWD (m)	Δ3M	30	47 (78)	31	36 (51)	0.18 [-0.32-0.68]
				Δ6M	28	43 (101)	22	36 (58)	0.08 [-0.48-0.64]
Cruz 2016	PA focused behavioral	PR (3M)	6MWD (m)	3M	13	547.9 (47.9)	13	529.7 (57.2)	0.33 [-0.44-1.11]
				6M	13	540.4 (31.1)	13	519.4 (50.8)	0.48 [-0.30-1.26]

	counselling (6M) + PR (3M)								
Duiverman 2008	Non-invasive positive pressure ventilation during PR	PR	6MWD (m)	3M	31	340 (119)	35	325 (108)	0.13 [-0.35-0.61]
			ESWT (s)	3M	31	475 (529.6)	35	449 (614.1)	0.04 [-0.44-0.53]
Kawagoshi 2015	Pedometer feedback during home-based PR	Home- based PR	6MWD (m)	12M	12	445 (138)	15	467 (151)	-0.15 [-0.91-0.61]
Kesten 2008	Tiotropium (25W) + PR (8W from W4 to W13)	Placebo (25W) + PR (8W from W4 to W13)	Treadmill endurance time (min)	13W	22	22.7 (11.6)	16	16.6 (11.2)	0.52 [-0.13-1.18]
				25W	22	26.8 (14.5)	16	17 (14)	0.67 [0.01-1.33]
Pleguezuelos 2013	Urban walking circuits (9M) + PR (3M)	PR (3M)	6MWD (m)	12M	34	445.41 (60.9)	37	406.6 (68.2)	0.59 [0.12- 1.07]
Studies comparing physical activity interventions versus another physical activity intervention									
Berry 2010	Lifestyle activity program	ET	6MWD (m)	3M	61	434.8 (68.7)	69	428.7 (69)	0.09 [-0.26-0.43]
				6M	61	426.7 (77.3)	69	439.8 (82)	-0.16 [-0.51-0.18]
				12M	61	408.1 (80.4)	69	430.5 (83)	-0.27 [-0.62-0.07]
Effing 2011	ET and self- management	Self- managem ent	ISWD (m)	Δ7M	68	12.2 (87.4)	60	-12.1 (65.1)	0.31 [-0.04-0.66]
				Δ12M	69	11.1 (92.2)	66	-24 (66.6)	0.43 [0.09-0.77]
			ESWD (m)	Δ7M	68	106.1 (555.8)	60	-15.9 (430.7)	0.24 [-0.11-0.59]
				Δ12M	68	53.3 (555.8)	66	-92.5 (442.7)	0.29 [-0.05-0.63]
Mendoza 2015	Pedometer-based counselling	Standard counselling	6MWD (m)	Δ3M	50	12.4 (34.6)	47	-0.7 (24.4)	0.43 [0.03-0.83]
Nguyen 2009	Cell phone- mediated exercise persistence program	Cell phone- mediated self- monitoring program	6MWD (ft)	3M	9	1206 (381)	8	1222 (379)	-0.04 [-0.99-0.91]
				6M	9	1194 (275)	8	1268 (384.6)	-0.21 [-1.17-0.74]
			Incremental cycle endurance (watt)	6M	9	48.9 (23.7)	8	49.2 (27.2)	-0.01 [-0.96-0.94]
Nguyen 2013	Internet-mediated dyspnea self- management program	General EDU	6MWD (ft)	3M	43	1417 (347.9)	41	1373 (347.9)	0.13 [-0.30-0.55]
				6M	43	1429 (374.7)	41	1314 (375.7)	0.30 [-0.13-0.73]
				12M	43	1415 (408.2)	41	1334 (410)	0.20 [-0.23-0.63]

Pomidori 2012	Home-based walking with fixed speed	Home- based walking with fixed distance	6MWD (m)	Δ 12M	18	73 (30)	18	54 (48)	0.46 [-0.20-1.13]
Probst 2011	High intensity and whole-body ET	Light intensity and breathing ET	6MWD (m)	12W	20	483 (89)	20	424 (114)	0.57 [-0.07-1.20]
			Maximum Work load (Watts)	12W	20	48 (30)	20	30 (30)	0.59 [-0.05-1.22]
			Endurance Time (min)	12W	20	17 (23.6)	20	7.9 (7.1)	0.51 [-0.12-1.14]
Sewell 2005	Individualized ET	General ET	ISWD (m)	Δ 7W	64	85.5 (73.1)	59	81.72 (73)	0.05 [-0.30- 0.41]
			ESWT (s)	Δ 7W	64	435.4 (370.6)	59	511.2 (367.6)	0.72 [0.35-1.09]

ET: Exercise Training, UC: Usual Care, 6MWD: Six Minute Walk Distance, M: Month/s, W: Week/s, O₂: Oxygen, ISWD: Incremental Shuttle Walk Distance, ESWT: Endurance Shuttle Walk Time, ISWD: Incremental Shuttle Walk Distance PR: Pulmonary Rehabilitation.

Online Table S5: Physical activity interventions effect on health-related quality of life (HRQL).

Study Name	Intervention	Control	Outcome (Unit)	Time Point	Intervention		Control		Effect Size [95%CI]
					n	Mean (SD)	n	Mean (SD)	
Studies comparing physical activity interventions versus usual care (or placebo)									
Borges 2014	Whole-body training exercise (≥ 3 sessions)	UC	SGRQ Total	Δ discharge	15	-10.7 (11.8)	14	-2.4 (19.6)	0.50 [-1.24-0.24]
				Δ1M post discharge	15	-24.3 (21.5)	14	-18.8 (28.1)	0.21 [-0.95-0.52]
Breyer 2010	Nordic walking	UC	SF36 Physical	3M	28	42.5 (9.62)	25	32.7 (6.36)	1.17 [0.58- 1.76]
				6M	28	44.1 (8.12)	25	30.8 (7.40)	1.68 [1.05- 2.32]
				9M	28	43.6 (9.52)	25	29.9 (6.89)	1.61 [0.98- 2.24]
			SF36 Mental	3M	14	47.2 (10.7)	16	41.53 (12.8)	0.46 [-0.26- 1.19]
				6M	14	47.4 (8.91)	16	40.7 (9.36)	0.71 [-0.03- 1.46]
				9M	14	46.3 (8.71)	16	38.7 (8.71)	0.85 [0.10- 1.60]
Dal Negro 2010 and 2012	EAs	Placebo	SGRQ Total	3M	44	69.35 (9.51)	44	72.79 (7.3)	0.4 [-0.01-0.84]
Faulkner 2010	Supervised ET	UC	CRQ Total	9W	6	90.9 (16.4)	6	91.3 (20.0)	-0.02 [-1.15- 1.11]
Hospes 2009	Exercise counselling	UC	SGRQ Total	12W	18	34.2 (13.5)	17	38.3 (16.8)	0.26 [-0.04-0.93]
			CCQ Total	12W	18	1.5 (0.8)	17	1.9 (0.9)	0.46 [-0.21-1.13]
			SF36 Physical functioning	12W	18	24.4 (3.5)	17	23.3 (4.7)	0.26 [-0.41- 0.93]
			SF36 Vitality	12W	18	16.0 (2.2)	17	15.7 (4.5)	0.08 [-0.58- 0.75]
			SF36 Bodily pain	12W	18	48.5 (14.5)	17	51.8 (11.9)	-0.24 [-0.91- 0.42]
			SF36 General health	12W	18	13.8 (2.9)	17	12.9 (3.0)	0.30 [-0.37- 0.97]
			SF36 Change in health status	12W	18	2.7 (0.6)	17	2.6 (0.7)	0.15 [-0.36- 0.66]
			SF36 Social functioning	12W	18	8.4 (1.8)	17	7.8 (1.9)	0.32 [-0.35- 0.98]

			SF36 Physical functioning	12W	18	6.8 (1.4)	17	6.2 (1.8)	0.36 [-0.30- 1.03]
			SF36 Emotional problems	12W	18	5.5 (0.9)	17	5.7 (0.9)	-0.22 [-0.88- 0.45]
			SF36 Mental health	12W	18	24.6 (2.8)	17	24.7 (4.1)	-0.03 [-0.69- 0.63]
Sandland 2008	Cylinder O2	Cylinder placebo	CRQ Dyspnea	8W	10	2.2 (0.9)	10	2.5 (1.4)	-0.24 [-1.12-0.64]
			CRQ Emotional function	8W	10	4.8 (2)	10	3.8 (2.4)	0.43 [-0.46-1.32]
			CRQ Mastery	8W	10	5.1 (2.2)	10	3.6 (2.2)	0.65 [-0.25-1.56]
			CRQ Fatigue	8W	10	3.4 (1.6)	10	3.3 (2)	0.05 [-0.82-0.93]
Jonsdottir 2015	Self-management	UC	SGRQ Total	12M	45	37.32 (19.11)	47	36.27 (19.42)	-0.05 [-0.46-0.35]
Kruis 2014	Integrated disease management	UC	CCQ Total	12M	554	-0.03 (0.7)	532	0.03 (0.7)	0.09 [-0.03- 0.20]
			SGRQ Total	12M	554	0.4 (12.7)	532	0.33 (13)	-0.01 [-0.12- 0.11]
			SF36 Physical	12M	554	-1.1 (8.6)	532	-0.48 (8.8)	-0.07 [-0.19- 0.05]
			SF36 Mental	12M	554	0.73 (9.7)	532	0.09 (9.8)	0.07 [-0.05- 0.18]
Schüz 2015 (Walters 2013)	Health monitoring	UC	SGRQ Total	6M	74	39.8 (20.5)	83	41.7 (17.8)	0.10 [-0.21-0.41]
				12M	74	41.9 (18.9)	80	40.5 (17.4)	-0.8 [-0.39-0.24]
			SF36 Physical	6M	74	39.9 (10.2)	83	38.4 (10.1)	0.15 [-0.17-0.46]
				12M	74	38.5 (10.3)	80	38.5 (9.4)	0.0 [-0.31-0.31]
			SF36 Mental	6M	74	49.7 (10.6)	83	48.9 (12)	0.07 [-0.24-0.38]
				12M	74	50.2 (11.4)	80	50.5 (10.5)	0.02 [-0.30-0.33]
Wilson 2015	PR Maintenance	UC	CRQ dyspnea	Δ12M	53	-0.35 (1.17)	57	-0.54 (1.21)	0.16 [-0.22-0.53]
			CRQ fatigue	Δ12M	53	-0.30 (1.09)	58	-0.41 (1.19)	0.10 [-0.28-0.47]

			CRQ emotion	Δ12M	53	0.00 (1.46)	58	0.02 (1.32)	-0.01 [-0.39-0.36]
			CRQ mastery	Δ12M	53	0.01 (1.42)	58	-0.06 (1.49)	0.05 [-0.32-0.42]
Steele 2008	Exercise adherence after PR	UC after PR	SOLDQ Physical functioning	20W	49	45 (18)	50	41 (15)	0.24 [-0.16- 0.64]
				12M	39	44 (18)	43	40 (16)	0.23 [-0.20- 0.67]
			SOLDQ Emotional functioning	20W	49	67 (20)	50	66 (19)	0.05 [-0.34- 0.44]
				12M	39	65 (21)	43	65 (18)	0.00 [-0.43- 0.43]
			SOLDQ Coping skills	20W	49	74 (19)	50	73 (16)	0.06 [-0.34- 0.45]
				12M	39	70 (19)	43	75 (14)	-0.30 [-0.73- 0.14]
			SOLDQ Treatment satisfaction	20W	49	59 (28)	50	66 (24)	-0.27 [-0.66- 0.13]
				12M	39	63 (24)	43	66 (26)	-0.12 [-0.55- 0.32]
			SF36 Physical	20W	49	35 (9)	50	33 (7)	0.25 [-0.15- 0.64]
				12M	39	32 (8)	43	31 (8)	0.12 [-0.31- 0.56]
SF36 Mental	20W	49	46 (11)	50	47 (9)	-0.10 [-0.49- 0.30]			
	12M	39	45 (11)	43	48 (10)	-0.28 [-0.72- 0.15]			
Studies comparing physical activity interventions added to PR versus PR alone									
Altenburg 2014	PA counselling (12W) + PR (9W)	PR (9W)	CRQ	3M	22	101 (18)	15	100 (21)	0.05 [-0.61-0.71]
				15M	10	77 (23)	13	80 (21)	-0.13 [-0.96-0.69]
			CCQ	3M	22	1.75 (0.9)	15	1.80 (1.0)	0.05 [-0.61-0.71]
				15M	10	3.10 (1.0)	13	2.30 (0.9)	-0.82 [-1.68-0.05]
Burtin 2015	PA counselling (6M) + PR (6M)	PR (6M)	CRQ	Δ3M	30	23 (14)	31	19 (12)	0.30 [-0.02-0.81]
				Δ6M	28	19 (21)	22	17 (14)	0.11 [-0.45-0.67]
Cruz 2016	PA focused behavioral counselling (6M) + PR (3M)	PR (3M)	SGRQ	3M	13	24.0 (13.6)	13	26.9 (15.2)	0.19 [-0.58-0.97]
				6M	13	23.1 (10.3)	13	26.2 (15.3)	0.23 [-0.54-1.00]
de Blok 2006	Lifestyle PA counselling (9W) + PR (9W)	PR (9W)	SGRQ	9W	8	56.3 (10.36)	8	44.7 (22.7)	-0.67 [-1.69-0.34]
			RAND36-PF	9W	8	28.8 (23.4)	8	34.4 (27.8)	-0.21 [-1.19-0.78]
			RAND36-V	9W	8	54.4 (18.9)	8	51.3 (18.4)	0.16 [-0.82-1.14]
			RAND36-BP	9W	8	74.0 (32.5)	8	72.5 (36.4)	0.04 [-0.94-1.02]

			RAND36-GHP	9W	8	25.6 (10.9)	8	39.3 (16.1)	-0.96 [-2.01-0.10]
			RAND36-HC	9W	8	68.7 (44.9)	8	65.6 (35.9)	0.07 [-0.91-1.05]
Kawagoshi 2015	Pedometer feedback during home-based PR	Home-based PR	CRQ	12M	12	108 (19)	15	110 (19)	-0.10 [-0.86-0.66]
Studies comparing physical activity interventions versus another physical activity intervention									
Berry 2010	Lifestyle activity program	ET	SF36 Physical	3M	61	36 (7)	69	36.7 (7)	-0.10 [-0.44-0.25]
				6M	61	35.7 (7.8)	69	36.5 (7)	-0.11 [-0.45-0.24]
				12M	61	35.2 (9.4)	69	36.2 (9.1)	-0.11 [-0.45-0.24]
			SF36 Mental	3M	61	51.3 (8.6)	69	51.9 (8.3)	-0.07 [-0.42-0.27]
				6M	61	51.1 (7.8)	69	52.3 (8.3)	-0.15 [-0.49-0.20]
				12M	61	50.3 (9.4)	69	51.1 (9.1)	-0.09 [-0.43-0.26]
			CRQ	3M	61	4.6 (0.8)	69	4.8 (0.8)	-0.25 [-0.59-0.10]
				6M	61	4.5 (0.8)	69	4.7 (0.8)	-0.25 [-0.59-0.10]
				12M	61	4.6 (0.8)	69	4.6 (0.8)	0.00 [-0.34-0.34]
Effing 2011	ET and self-management	Self-management	CRQ Dyspnea	Δ7M	68	0.37 (1.07)	63	0.04 (0.95)	0.32 [-0.02- 0.67]
				Δ12M	76	0.30 (0.88)	68	-0.02 (0.98)	0.34 [0.01- 0.67]
			CRQ Fatigue	Δ7M	68	0.15 (1.23)	63	0.03 (1.34)	0.09 [-0.25- 0.44]
				Δ12M	76	0.15 (1.3)	68	0.06 (1.31)	0.07 [-0.26- 0.40]
			CRQ Emotional function	Δ7M	68	-0.02 (0.9)	63	-0.05 (0.95)	0.03 [-0.31- 0.38]
				Δ12M	76	0.18 (0.95)	68	0.08 (0.99)	0.10 [-0.22- 0.43]
			CRQ Mastery	Δ7M	68	0.13 (0.98)	63	0.14 (0.95)	-0.01 [-0.35- 0.33]
				Δ12M	76	0.33 (2.87)	68	0.22 (0.98)	0.05 [-0.28- 0.38]
			CCQ Total	Δ7M	67	-0.03 (0.65)	60	-0.01 (0.77)	0.03 [-0.32- 0.38]
Δ12M	70	-0.10 (0.66)		66	-0.08 (0.81)	0.03 [-0.31- 0.36]			
Mendoza 2015	Pedometer-based counselling	Standard counselling	SGRQ Total	Δ3M	50	-8.8 (12.2)	47	-3.8 (10.9)	0.43 [0.03-0.83]
Moy 2015	Internet-mediated pedometer-based program	Pedometer recording only	SGRQ Total	Δ4M	144	-3.2 (11.1)	77	-0.8 (10.9)	0.22 [-0.06-0.49]
Nguyen 2009	Cell phone-mediated exercise	Cell phone-mediated self-	SGRQ Total	3M	9	39 (14.1)	8	54.4 (14.1)	1.04 [0.00-2.07]
				6M	9	41.7 (14.1)	8	45.2 (14.6)	0.23 [-0.72-1.19]
				3M	9	32.9 (6.9)	8	27.5 (6.8)	0.75 [-0.25-1.74]

	persistence program	monitoring program	SF36 Physical	6M	9	33.8 (6.9)	8	30.3 (7.1)	0.48 [-0.49-1.45]
			SF36 Mental	3M	9	48.5 (11.4)	8	48.4 (11.6)	0.01 [-0.94-0.96]
				6M	9	46.9 (11.4)	8	55.2 (11.8)	-0.68 [-1.67-0.31]
Nguyen 2013	Internet-mediated dyspnea self-management program	General EDU	CRQ Total	3M	43	102.2 (20.1)	41	99.1 (20.2)	0.15 [-0.28-0.58]
				6M	43	104.6 (21.9)	41	97.6 (22.1)	0.32 [-0.12-0.75]
				12M	43	104.8 (23.9)	41	98.4 (24.3)	0.26 [-0.17-0.69]
			SF36 Physical	3M	43	36.5 (10.5)	41	36.1 (10.4)	0.04 [-0.39-0.47]
				6M	43	37.1 (11.2)	41	35 (11.3)	0.18 [-0.24-0.61]
				12M	43	38.9 (11.2)	41	35.2 (11.3)	0.33 [-0.10-0.77]
			SF36 Mental	3M	43	53.7 (10.2)	41	51.1 (10.5)	0.25 [-0.18-0.68]
				6M	43	52.9 (11)	41	51.2 (11.1)	0.15 [-0.28-0.58]
				12M	43	52.2 (11.7)	41	52.1 (11.8)	0.01 [-0.42-0.44]
Pomidori 2012	Home-based walking with fixed speed	Home-based walking with fixed distance	SGRQ Total	6M	18	33 (11)	18	31 (13)	-0.16 [-0.82-0.49]
				Δ12M	18	6 (13)	18	5 (7)	-0.09 [-0.75-0.56]
Probst 2011	High intensity and whole-body ET	Light intensity and breathing ET	SGRQ Total	12W	20	38.4 (20.7)	20	47.7 (11.7)	0.52 [-0.11-1.16]
Sewell 2005	Individualized ET	General ET	CRQ Dyspnea	Δ7W	64	0.62 (1.4)	64	0.89 (1.4)	-0.19 [-0.54- 0.16]
			CRQ Fatigue	Δ7W	64	0.53 (1.4)	64	0.83 (1.3)	0.11 [-0.24- 0.46]
			CRQ Emotional function	Δ7W	64	0.62 (1.2)	64	0.60 (1.4)	0.02 [-0.33- 0.36]
			CRQ Mastery	Δ7W	64	0.66 (1.6)	64	0.76 (1.3)	-0.07 [-0.42- 0.28]
Tabak 2014	Internet-mediated PA counselling	ET	CCQ	Δ3W	14	-0.3 (0.5)	15	0 (0.6)	0.53 [1.27-0.22]

SF-36: Self-Reported 36 questionnaire, SGRQ: St. George Respiratory Questionnaire. CRQ: Chronic Respiratory Questionnaire. SOLDQ: Seattle Obstructive Lung Disease Questionnaire. NS: Non-significant, CRQ-SR: Chronic Respiratory Questionnaire- Self Reported. CCQ: Clinical COPD Questionnaire. ET: Exercise Training, UC: Usual Care, PR: Pulmonary Rehabilitation, M: Month/s, W: Week/s, O₂: Oxygen, EDU: Education.

Online Table S6: physical activity interventions effect on dyspnea.

Study Name	Intervention	Control	Outcome (Unit)	Time Point	Intervention		Control		Effect Size [95%CI]
					n	Mean (SD)	n	Mean (SD)	
Studies comparing physical activity interventions versus usual care (or placebo)									
Faulkner 2010	Supervised ET	UC	MRC	9W	6	2.0 (0.5)	8	2.5 (0.7)	0.75 [-0.36-1.86]
Hornikx 2015	PA counselling	UC	MRC	Δ1M	15	0 (0.74)	15	0 (0.74)	0.00 [-0.72-0.72]
Kruis 2014	Integrated disease management	UC	MRC	12M	554	0.23 (1.1)	532	0.19 (1.2)	0.03 [-0.08, 0.15]
Steele 2008	Exercise adherence after PR	UC after PR	Activity SOB	20W	49	4.5 (2.1)	50	4.9 (2.4)	0.18 [-0.22-0.57]
				12M	39	4.8 (2.2)	43	4.9 (2.5)	0.04 [-0.39-0.48]
			SOB	20W	49	3.8 (2.2)	50	4.3 (2.6)	0.21 [-0.19-0.60]
				12M	39	4.0 (2.3)	43	4.4 (2.6)	0.16 [-0.27--0.60]
Studies comparing physical activity interventions added to PR versus PR alone									
Kawagoshi 2015	Pedometer feedback during home-based PR	Home-based PR	MRC	12M	12	0.9 (1.2)	15	1.4 (0.9)	0.46 [-0.31-1.24]
Studies comparing physical activity interventions versus another physical activity intervention									
Mendoza 2015	Pedometer-based counselling	Standard counselling	mMRC	Δ3M	50	0.2 (0.7)	47	0 (0.9)	-0.25 [-0.65-0.15]
Probst 2011	High intensity and whole-body ET	Light intensity and breathing ET	MRC	12W	20	3 (1.5)	20	4 (1.5)	0.65 [-0.02-1.29]
Tabak 2014	Internet-mediated PA counselling	ET	MRC	Δ3W	14	-0.3 (0.7)	15	-0.2 (0.9)	0.12 [-0.61-0.85]

ET: Exercise Training, PA: Physical Activity, MRC: Medical Research Council dyspnea scale, mMRC: Modified Medical Research Council dyspnea scale, SOB: Shortness of Breath. M: Month/s, W: Week/s, Δ: Change from Baseline.

Online Table S7: physical activity interventions effect on lung function.

Study Name	Intervention	Control	Outcome (Unit)	Time Point	Intervention		Control		Effect Size [95%CI]
					n	Mean (SD)	n	Mean (SD)	
Studies comparing physical activity interventions versus usual care (or placebo)									
Borges 2014	Whole-body training exercise (≥ 3 sessions)	UC	FEV ₁ % predicted	Δ discharge	15	44.6 (14.1)	14	42.3 (14.4)	0.16 [-0.57-0.89]
Dal Negro 2010 and 2012	EAAs	Placebo	FEV ₁ (l/sec)	1M	44	0.79 (0.42)	44	0.74 (0.21)	0.15 [-0.27-0.57]
				3M	44	0.75 (0.36)	44	0.71 (0.20)	0.14 [-0.28-0.55]
Faulkner 2010	Supervised ET	UC	FEV ₁ % predicted	9W	6	65.3 (11.9)	8	66.5 (12.1)	-0.09 [-1.15- 0.97]
Steele 2008	Exercise adherence after PR	UC after PR	FEV ₁ % predicted	20W	49	44 (18)	50	37 (17)	0.40 [0.00- 0.79]
Studies comparing physical activity interventions added to PR versus PR alone									
Duiverman 2008	NIPPV during PR	PR	FEV ₁ (l/sec)	12M	39	40 (19)	43	37 (17)	0.17 [-0.27- 0.60]
Studies comparing physical activity interventions versus another physical activity intervention									
Berry 2003	Maintenance ET	UC	FEV ₁ (l/sec)	15M	62	1.56 (0.24)	56	1.56 (0.22)	0.00 [-0.36- 0.36]
			FER	15M	62	53.4 (4.82)	56	55.3 (5.34)	-0.37 [-0.74- -0.01]

NIPPV: Non-Invasive Positive Pressure Ventilation, PR: Pulmonary Rehabilitation, UC: Usual Care, FEV₁: Forced Expired Volume in One Second, M: Month/S, W: Week/S, FER: Forced Expiratory Ratio, Δ: Change from Baseline.