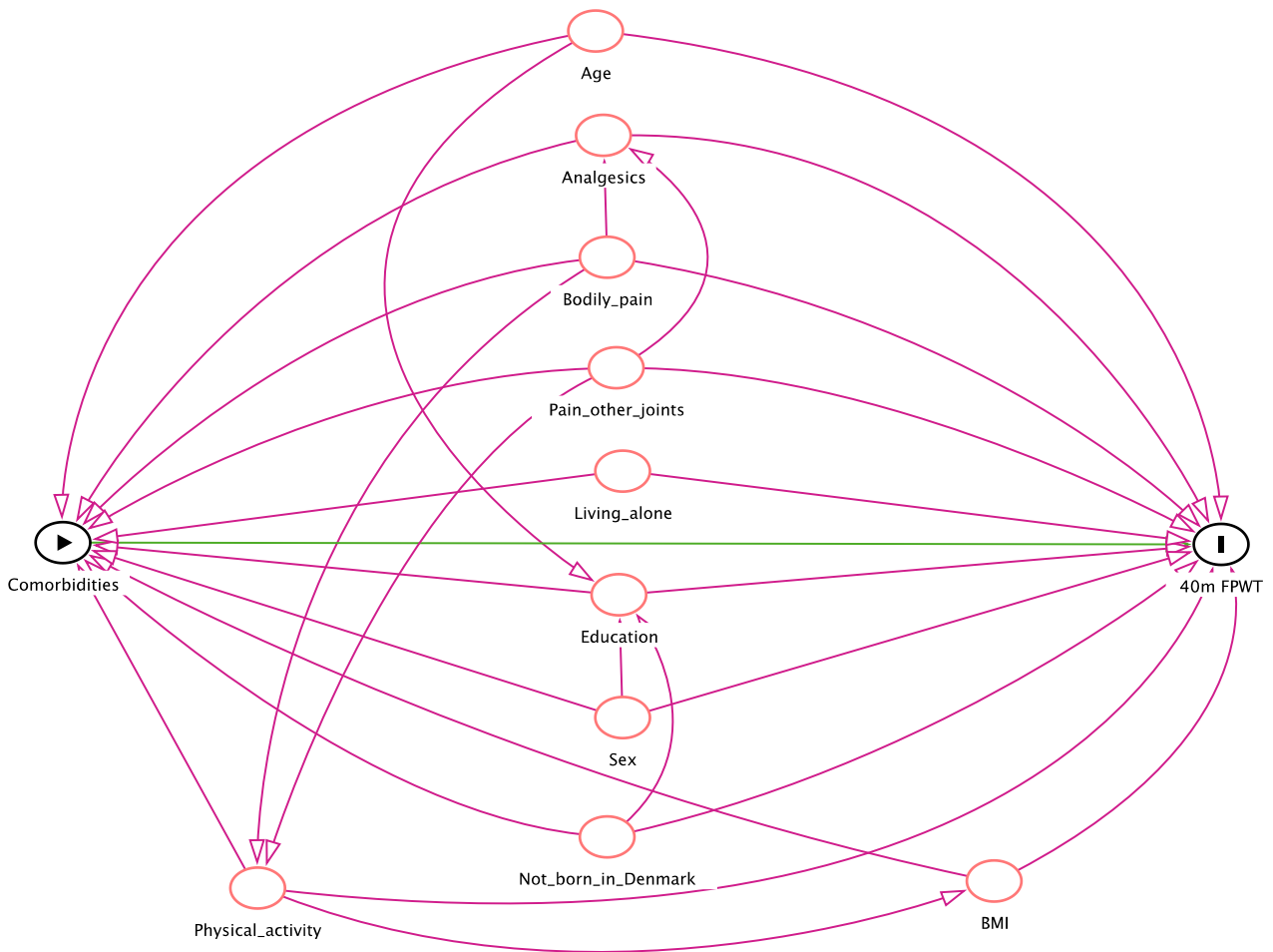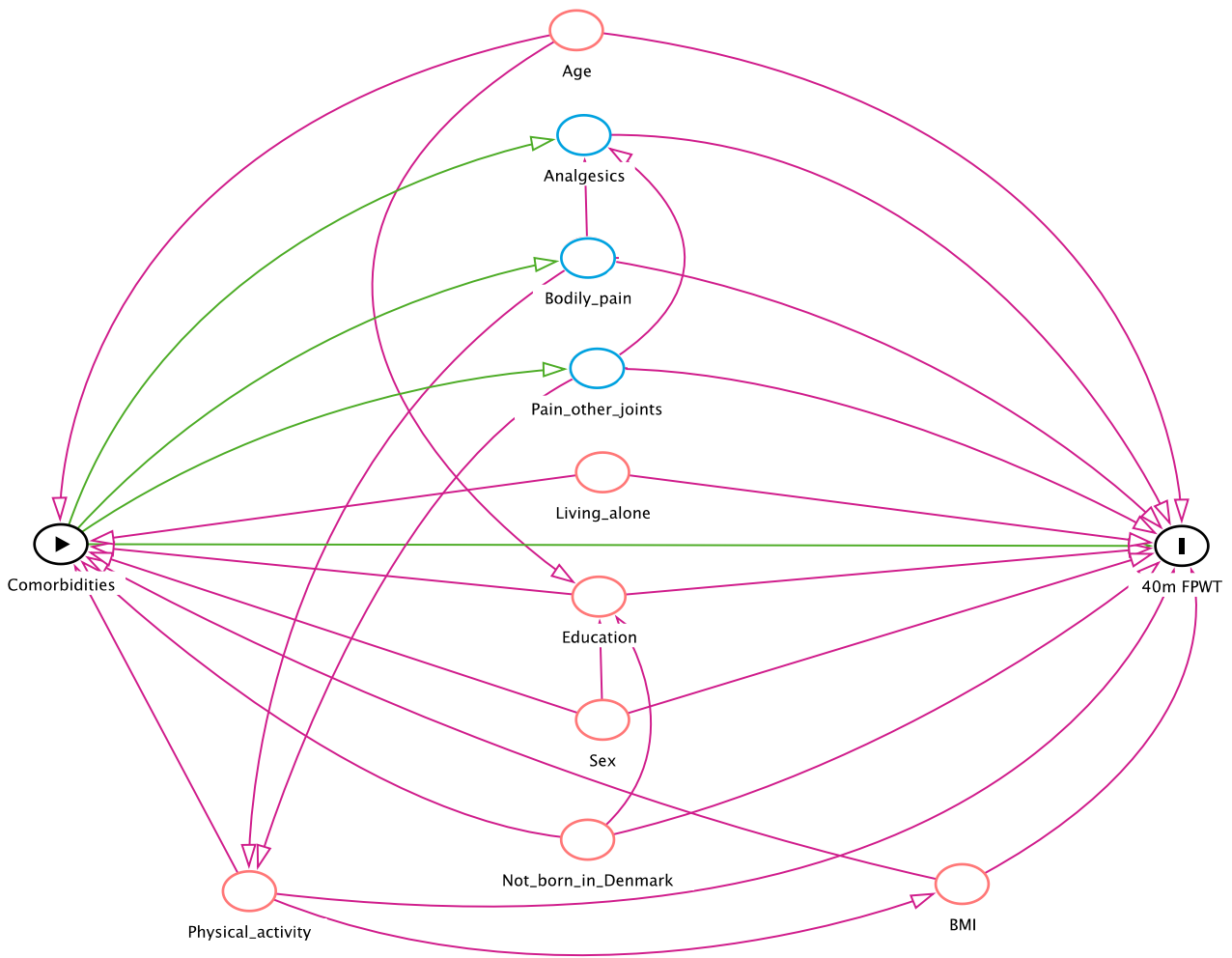# Supplementary material

Supplementary Figure S1. Directs Acyclic Graph (DAG) of the assumed causal relations between exposure, outcome (in this example 40-m FPWT), and confounders in the primary analyses. Red lines and variables reflect possible confounding paths. Green line reflects the assumed causal path.

Supplementary Figure S2. Directs Acyclic Graph (DAG) of the assumed causal relations between exposure, outcome (in this example 40m FPWT), and confounders in the sensitivity analysis. Red lines and variables reflect possible confounding paths. Green line reflects the assumed causal paths, and blue variables indicate intermediate factors.

Supplementary Table S1. Baseline characteristics of participants assessed immediately after the program and participants lost to follow-up for the main outcome (40-m FPWT).

	No comorbidities		Comorbidities	
	Assessed at follow-up n=7,993 (66%)	Lost to follow-up n=4,135 (34%)	Assessed at follow-up n=7,943 (64%)	Lost to follow-up n=4,442 (36%)
Most affected joint, n (%)				
Knee	5,827 (73)	3,096 (75)	6,027 (76)	3,321 (75)
Hip	2,166 (27)	1,039 (25)	1,916 (24)	1,121 (25)
Age, years (SD)	63.2 (9.9)	62.2 (10.5)	66.6 (8.7)	66.1 (9.4)
Female, n (%)	5,987 (75)	3,065 (74)	5,658 (71)	3,089 (70)
BMI, kg/m^2 (SD)[a]	27.2 (4.8)	27.5 (5.0)	28.9 (5.2)	29.3 (5.6)
Educational level, n (%)[b]				
Primary school	1,171 (15)	567 (14)	1,579 (20)	926 (21)
Secondary school	895 (11)	434 (11)	908 (11)	499 (11)
Short-term education[c]	1,586 (20)	787 (19)	1,584 (20)	862 (19)
Middle-term education[d]	3,392 (42)	1,753 (42)	3,073 (39)	1,652 (37)
Long-term education[e]	948 (12)	593 (14)	795 (10)	498 (11)
Born outside Denmark, n (%)[f]	294 (4)	172 (4)	276 (3)	175 (4)
Living alone, n (%)[g]	1,777 (22)	974 (24)	2,160 (27)	1,305 (29)
Physical activity level, n (%)[h]				
Inactive	107 (1)	93 (2)	161 (2)	163 (4)
Low (e.g. walking, limited housework)	1,899 (24)	1,147 (28)	2,460 (31)	1,608 (36)
Moderate (e.g. swimming, unlimited housework)	2,692 (34)	1,315 (32)	2,696 (34)	1,401 (32)
High (e.g. prolonged biking and fitness)	2,658 (33)	1,212 (29)	2,213 (28)	1,042 (23)
Very high (e.g. running, tennis and skiing)	629 (8)	366 (9)	410 (5)	222 (5)
Pain in other knee or hip joints, n (%)				
No	3,533 (44)	1,854 (45)	3,283 (41)	1,865 (42)
Bilateral joint (from most affected joint)	2,812 (35)	1,482 (36)	2,860 (36)	1,542 (35)
Hip or knee[i]	1,336 (17)	630 (15)	1,439 (18)	795 (18)
Bilateral joint and hip or knee[i]	312 (4)	169 (4)	361 (5)	240 (5)
Number of bodily pain areas, n (%)				
0	245 (3)	111 (3)	205 (3)	118 (3)
1-2	3,765 (47)	1,891 (46)	3,477 (44)	1,833 (41)
3-4	2,156 (27)	1,134 (27)	2,232 (28)	1,210 (27)
5-6	905 (11)	465 (11)	923 (12)	545 (12)
7 or more	922 (12)	534 (13)	1,106 (14)	736 (17)
Use of analgesics within recent 3 months[j]	4,791 (60)	2,476 (60)	5,223 (66)	2,925 (66)
QoL (EQ-5D-5L, -0.624 to 1.000), mean (SD)[k]	0.728 (0.104)	0.716 (0.112)	0.710 (0.110)	0.691 (0.111)
Pain intensity (VAS, 0-100 mm), mean (SD)[l]	45.2 (21.5)	47.1 (22.3)	47.9 (21.4)	50.8 (22.5)
40m Fast-Paced Walk Test, m/s (SD)[m]	1.57 (0.33)	1.55 (0.34)	1.45 (0.32)	1.41 (0.34)

n: Number, SD: Standard Deviation, BMI: Body Mass Index (kg/m^2), VAS: Visual Analogue Scale, QoL: Quality of Life. [a]69 missing observations, [b]11 missing observations, [c]under 3 years after secondary school, [d]3-4 years after secondary school, [e]at least 5 years after secondary school. [f]7 missing observations, [g]7 missing observations, [h]19 missing observations, [i]hip if most affected joint is knee and vice versa, [j]at least one of the following: Acetaminophen, oral or topical Non-Steroidal Anti-inflammatory Drug (NSAID), Morphine, Tramadol, or Codeine, [k]21 missing observations, [l]30 missing observations, [m]1,350 missing observations.

Supplementary Table S2. Baseline characteristics of participants within strata of comorbidities (1-6 most prevalent strata of comorbidities in GLA:D).

	No Comor (n = 12,128)	HT (n = 5,716)	HT + DM (n = 729)	HT + Hea (n = 630)	Respiratory (n = 558)	HD (n = 551)	Neurologic (n = 508)
Most affected joint, n (%)							
Knee	8,923 (74)	4,375 (77)	557 (76)	465 (74)	399 (72)	409 (74)	370 (73)
Hip	3,205 (26)	1,341 (23)	172 (26)	165 (26)	159 (28)	142 (26)	138 (27)
Age, years (SD)	62.9 (10.1)	66.8 (8.5)	67.2 (8.0)	70.8 (7.4)	65.4 (8.7)	69.7 (8.3)	61.9 (9.7)
Female, n (%)	9,052 (75)	4,160 (73)	467 (64)	352 (56)	423 (76)	298 (54)	421 (83)
BMI, kg/m^2 (SD)[a]	27.3 (4.9)	29.4 (5.3)	32.0 (5.8)	28.8 (4.6)	27.7 (5.3)	27.1 (4.4)	27.4 (5.3)
Educational level, n (%)[b]							
Primary school	1,738 (14)	1,166 (20)	166 (23)	136 (22)	96 (17)	90 (16)	78 (15)
Secondary school	1,329 (11)	662 (12)	102 (14)	87 (14)	49 (9)	42 (8)	50 (10)
Short-term education[c]	2,373 (20)	1,145 (20)	152 (21)	91 (14)	119 (21)	89 (16)	115 (23)
Middle-term education[d]	5,145 (42)	2,143 (38)	255 (35)	236 (37)	235 (42)	245 (44)	218 (843)
Long-term education[e]	1,541 (13)	597 (10)	54 (7)	80 (13)	59 (11)	85 (15)	47 (9)
Born outside Denmark, n (%)[f]	466 (4)	165 (3)	26 (4)	17 (3)	21 (4)	15 (3)	14 (3)
Living alone, n (%)[g]	2,751 (23)	1,562 (27)	230 (32)	184 (29)	153 (27)	142 (26)	109 (21)
Physical activity level, n (%)[h]							
Inactive	200 (2)	126 (2)	31 (4)	21 (3)	12 (2)	11 (2)	8 (2)
Low (e.g. walking and limited housework)	3,046 (25)	1,717 (30)	298 (41)	226 (836)	180 (32)	139 (25)	159 (31)
Moderate (e.g. swimming and unlimited housework)	4,007 (33)	1,978 (35)	218 (30)	192 (31)	178 (32)	191 (35)	176 (35)
High (e.g. prolonged biking and fitness)	3,870 (32)	1,609 (28)	149 (20)	150 (24)	155 (28)	174 (32)	138 (27)
Very high (e.g. running, tennis and skiing)	995 (8)	283 (5)	32 (49)	40 (6)	32 (6)	35 (6)	27 (5)
Pain in other knee or hip joints, n (%)							
No	5,387 (44)	2,463 (43)	311 (43)	276 (44)	227 (41)	234 (42)	204 (840)
Bilateral joint (from most affected joint)	4,294 (35)	2,039 (36)	259 (36)	213 834)	191 (34)	194 (35)	180 (35)
Hip or knee[i]	1,966 (16)	974 (17)	123 (17)	107 (17)	113 (20)	101 (18)	98 (19)
Bilateral joint and hip or knee[i]	481 (4)	240 (4)	36 (5)	34 (5)	27 (5)	22 (4)	26 (5)
Number of bodily pain areas, n (%)							
0	356 (3)	174 (3)	11 (2)	12 (2)	13 (2)	21 (4)	10 (2)
1-2	5,656 (47)	2,672 (47)	318 (44)	279 (44)	213 (38)	253 (46)	191 (38)
3-4	3,290 (27)	1,587 (28)	205 (28)	195 (31)	165 (30)	156 (28)	131 (26)
5-6	1,370 (11)	632 (11)	86 (12)	69 (11)	79 (14)	51 (9)	61 (12)
7 or more	1,456 (12)	651 (11)	109 (15)	75 (12)	88 (16)	70 (13)	115 (23)
Use of analgesics within recent 3 months[j]	7,267 (60)	3,781 (66)	514 (71)	397 (63)	392 (70)	284 (52)	324 (64)
Quality of life (EQ-5D-5L, -0.624 to 1.000), mean (SD)[k]	0.724 (0.107)	0.715 (0.111)	0.700 (0.109)	0.702 (0.102)	0.708 (0.105)	0.719 (0.103)	0.700 (0.118)
Pain intensity (VAS, 0-100 mm), mean (SD)[l]	45.9 (21.8)	48.1 (22.0)	50.6 (21.7)	49.2 (20.9)	48.6 (21.0)	45.4 (20.7)	49.8 (22.0)
40m Fast-Paced Walk Test, m/s (SD)[m]	1.56 (0.33)	1.44 (0.31)	1.33 (0.32)	1.38 (0.31)	1.49 (0.32)	1.47 (0.34)	1.50 (0.34)

n: Number, SD: Standard Deviation, BMI: Body Mass Index (kg/m^2), VAS: Visual Analogue Scale. Comor: Comorbidities, HT: Hypertension, DM: Diabetes mellitus 1 and 2, HD: Heart diseases. [a]69 missing observations, [b]11 missing observations, [c]under 3 years after secondary school, [d]3-4 years after secondary school, [e]at least 5 years after secondary school. [f]7 missing observations, [g]7 missing observations, [h]19 missing observations, [i]hip if most affected joint is knee and vice versa, [j]at least one of the following: Acetaminophen, oral or topical

Non-Steroidal Anti-inflammatory Drug (NSAID), Morphine, Tramadol, or Codeine, [k]21 missing observations, [l]30 missing observations, [m]1350 missing observations.

Supplementary Table S2 continued. (7-13 most prevalent strata of comorbidities in GLA:D).

	RA (n = 501)	Ulcer (n = 447)	Depression (n = 408)	DM (n = 358)	HT + Resp (n = 323)	HT + RA (n = 275)	HT + Neu (n = 274)
Most affected joint, n (%)							
Knee	363 (72)	336 (75)	305 (75)	287 (80)	239 (74)	210 (76)	206 (75)
Hip	138 (28)	111 (25)	103 (25)	71 (20)	84 (26)	65 (24)	68 (25)
Age, years (SD)	64.3 (9.4)	62.2 (10.0)	59.7 (10.2)	66.1 (8.9)	69.3 (8.0)	67.1 (8.4)	65.9 (8.7)
Female, n (%)	334 (67)	351 (79)	330 (81)	205 (57)	248 (77)	186 (68)	209 (76)
BMI, kg/m^2 (SD)[a]	27.3 (4.8)	27.9 (4.6)	28.8 (5.6)	29.9 (5.2)	30.0 (5.6)	29.6 (4.9)	29.1 (6.1)
Educational level, n (%)[b]							
Primary school	98 (20)	66 (15)	75 (18)	82 (23)	93 (29)	58 (21)	65 (24)
Secondary school	69 (14)	50 (11)	52 (13)	35 (10)	32 (10)	34 (12)	40 (15)
Short-term education[c]	90 (18)	104 (23)	83 (20)	78 (22)	62 (19)	54 (20)	51 (19)
Middle-term education[d]	176 (35)	186 (42)	162 (40)	135 (38)	113 (35)	103 (38)	86 (31)
Long-term education[e]	66 (13)	40 (9)	36 (9)	28 (8)	23 (7)	25 (9)	32 (12)
Born outside Denmark, n (%)[f]	42 (8)	33 (7)	35 (9)	19 (5)	9 (3)	10 (4)	6 (2)
Living alone, n (%)[g]	121 (24)	106 (24)	163 (40)	100 (28)	115 (36)	80 (29)	80 (29)
Physical activity level, n (%)[h]							
Inactive	8 (2)	13 (3)	17 (4)	15 (4)	9 (3)	7 (3)	8 (3)
Low (e.g. walking and limited housework)	170 (34)	151 (34)	162 (40)	105 (29)	135 (42)	99 (36)	108 (399)
Moderate (e.g. swimming and unlimited housework)	144 (29)	138 (31)	120 (29)	124 (35)	108 (34)	93 (34)	91 (33)
High (e.g. prolonged biking and fitness)	144 (29)	119 (27)	82 (20)	94 (26)	63 (20)	67 (24)	54 (20)
Very high (e.g. running, tennis and skiing)	35 (7)	26 (6)	27 (7)	19 (5)	7 (2)	9 (3)	13 85)
Pain in other knee or hip joints, n (%)							
No	208 (42)	150 (34)	155 (38)	175 (49)	113 (35)	115 (42)	102 (37)
Bilateral joint (from most affected joint)	176 (35)	175 (39)	143 (35)	111 (31)	121 (37)	87 (32)	103 (38)
Hip or knee[i]	88 (18)	98 (22)	77 (19)	53 (15)	65 (20)	63 (23)	52 (19)
Bilateral joint and hip or knee[i]	29 (6)	24 (5)	33 (8)	19 (5)	24 (7)	10 (4)	17 (6)
Number of bodily pain areas, n (%)							
0	5 (1)	9 (2)	15 (4)	10 (3)	7 (2)	8 (3)	5 (2)
1-2	176 (35)	139 (31)	130 (32)	174 (49)	116 (36)	105 (38)	109 (40)
3-4	126 (25)	120 (27)	98 (24)	92 (26)	104 (32)	72 (26)	76 (28)
5-6	90 (18)	57 (13)	72 (18)	37 (10)	31 (10)	33 (12)	33 (12)
7 or more	104 (21)	122 (27)	93 (23)	45 (13)	65 (20)	57 (21)	51 (19)
Use of analgesics within recent 3 months[j]	322 (64)	293 (66)	278 (68)	224 (63)	230 (71)	181 (66)	191 (69)
Quality of life (EQ-5D-5L, -0.624 to 1.000), mean (SD)[k]	0.695 (0.110)	0.688 (0.120)	0.611 (0.155)	0.706 (0.117)	0.700 (0.102)	0.704 (0.108)	0.700 (0.125)
Pain intensity (VAS, 0-100 mm), mean (SD)[l]	49.5 (21.7)	51.8 (22.6)	52.7 (22.0)	48.5 (22.4)	49.1 (19.6)	49.8 (24.1)	48.3 (21.9)
40m Fast-Paced Walk Test, m/s (SD)[m]	1.49 (0.32)	1.52 (0.35)	1.46 (0.32)	1.41 (0.32)	1.34 (0.30)	1.41 (0.35)	1.41 (0.32)

n: Number, SD: Standard Deviation, BMI: Body Mass Index (kg/m^2), VAS: Visual Analogue Scale. HT: Hypertension, RA: Rheumatoid Arthritis, Resp: Respiratory diseases, Neu:

Neurologic diseases. [a]69 missing observations, [b]11 missing observations, [c]under 3 years after secondary school, [d]3-4 years after secondary school, [e]at least 5 years after secondary school. [f]7 missing observations, [g]7 missing observations, [h]19 missing observations, [i]hip if most affected joint is knee and vice versa, [j]at least one of the following: Acetaminophen, oral or topical Non-Steroidal Anti-inflammatory Drug (NSAID), Morphine, Tramadol, or Codeine, [k]21 missing observations, [l]30 missing observations, [m]1350 missing observations.

Supplementary Table S2 continued. (14-20 most prevalent strata of comorbidities in GLA:D).

	HT + Ulcer (n = 254)	**Cancer** (n = 234)	**HT + Dep** (n = 203)	**HT + Can** (n = 137)	**HT + HD + DM** (n = 117)	**Anaemia** (n = 83)	**HT + Ren** (n = 79)
Most affected joint, n (%)							
Knee	186 (73)	176 (75)	155 (76)	103 (75)	84 (72)	65 (78)	58 (73)
Hip	68 (27)	58 (25)	48 (24)	34 (25)	33 (28)	18 (22)	21 (27)
Age, years (SD)	68.0 (9.1)	67.9 (8.8)	63.6 (10.3)	70.9 (6.7)	70.3 (7.1)	64.8 (10.3)	66.1 (10.5)
Female, n (%)	204 (80)	140 (60)	169 (83)	72 (44)	52 (44)	71 (86)	55 (70)
BMI, kg/m^2 (SD)[a]	29.1 (5.1)	27.0 (4.5)	30.6 (5.9)	28.7 (4.6)	31.1 (4.7)	27.5 (5.3)	30.1 (6.4)
Educational level, n (%)[b]							
Primary school	64 (25)	36 (15)	50 (25)	27 (20)	30 (26)	14 (17)	15 (19)
Secondary school	29 (12)	15 (6)	21 (10)	14 (10)	10 (9)	5 (6)	9 (11)
Short-term education[c]	50 (20)	40 (17)	49 (24)	25 (18)	21 (18)	16 (19)	12 815)
Middle-term education[d]	89 (35)	104 (44)	66 (33)	51 (37)	45 838)	41 849)	36 (46)
Long-term education[e]	20 (8)	39 (17)	17 (8)	20 (15)	11 (9)	7 (8)	7 (9)
Born outside Denmark, n (%)[f]	13 (5)	9 (4)	4 (2)	3 (2)	1 (1)	4 85)	5 (6)
Living alone, n (%)[g]	83 (33)	51 (22)	78 (38)	40 (29)	33 (28)	20 (24)	15 (19)
Physical activity level, n (%)[h]							
Inactive	9 (4)	3 (1)	11 (5)	3)82)	9 (8)	27 (33)	3 (4)
Low (e.g. walking and limited housework)	97 (38)	61 (26)	98 (48)	48 (359)	56 (48)	0 (0)	32 (41)
Moderate (e.g. swimming and unlimited housework)	89 (35)	77 (33)	59 (29)	42 (31)	25 (21)	29 (35)	25 832)
High (e.g. prolonged biking and fitness)	51 (20)	75 (32)	34 (17)	36 (26)	22 (19)	23 (28)	16 (20)
Very high (e.g. running, tennis and skiing)	8 (3)	18 (8)	1 (0)	8 (6)	5 (84)	4 (5)	3 (4)
Pain in other knee or hip joints, n (%)							
No	71 (28)	103 (44)	73 (36)	56 (41)	51 (44)	34 (41)	27 (34)
Bilateral joint (from most affected joint)	96 (38)	79 (34)	75 (37)	54 (39)	35 (830)	33 (40)	38 (48)
Hip or knee[i]	67 (26)	39 (17)	42 (21)	23 (17)	24 (21)	15 (18)	12 (815)
Bilateral joint and hip or knee[i]	20 (8)	13 (6)	13 (6)	4 (3)	7 (6)	1 (1)	2 (83)
Number of bodily pain areas, n (%)							
0	4 (2)	7 (3)	2 (1)	3 (2)	3 (3)	34 (41)	4 (5)
1-2	77 (30)	110 (47)	71 (35)	67 (49)	50 (43)	0 (0)	26 (33)
3-4	77 (30)	68 (29)	62 (31)	29 (21)	30 (26)	22 (27)	27 (34)
5-6	34 (13)	19 (8)	29 (14)	19 (14)	14 (12)	13 (16)	9 (11)
7 or more	62 (24)	30 (13)	39 (19)	19 (14)	20 (17)	14 (17)	13 (16)
Use of analgesics within recent 3 months[j]	187 (74)	141 (60)	149 (73)	88 (64)	72 (62)	48 (58)	52 (66)
Quality of life (EQ-5D-5L, -0.624 to 1.000), mean (SD)[k]	0.694 (0.118)	0.710 (0.111)	0.614 (0.151)	0.716 (0.090)	0.676 (0.109)	0.727 (0.084)	0.706 (0.096)
Pain intensity (VAS, 0-100 mm), mean (SD)[l]	53.3 (20.8)	47.3 (21.7)	54.0 (21.6)	46.9 (21.4)	52.7 (21.0)	48.6 (22.4)	48.8 (25.7)

| 40m Fast-Paced Walk Test, m/s (SD)[m] | 1.40 (0.33) | 1.51 (0.33) | 1.34 (0.32) | 1.40 (0.31) | 1.29 (0.29) | 1.51 (0.32) | 1.48 (0.37) |

n: Number, SD: Standard Deviation, BMI: Body Mass Index (kg/m^2), VAS: Visual Analogue Scale. HT: Hypertension, DM: Diabetes mellitus 1 and 2, HD: Heart diseases, Can: Cancer, Dep: Depression, Ren: Renal or liver diseases, [a]69 missing observations, [b]11 missing observations, [c]under 3 years after secondary school, [d]3-4 years after secondary school, [e]at least 5 years after secondary school. [f]7 missing observations, [g]7 missing observations, [h]19 missing observations, [i]hip if most affected joint is knee and vice versa, [j]at least one of the following: Acetaminophen, oral or topical Non-Steroidal Anti-inflammatory Drug (NSAID), Morphine, Tramadol, or Codeine, [k]21 missing observations, [l]30 missing observations, [m]1350 missing observations.

Supplementary Table S3. Sensitivity analyses excluding the confounders bodily pain, pain in other knee or hip joints, physical activity, and analgesics in the adjusted analysis for difference in change in 40-meter Fast-Paced Walk Test (40-m FPWT) from baseline to immediately after exercise therapy and education in between participants with and without comorbidities.

	Change 3 mo. 40-m FPWT Mean m/s (95% CI)
No comor, n=12,128	0.12 (0.12 to 0.13)
	Adjusted* difference in <u>change</u> at 3 months Mean m/s (95% CI)
HT, n=5,716	-0.00 (-0.01 to 0.01)
HT + DM, n=729	0.00 (-0.02 to 0.02)
HT + HD, n=630	-0.01 (-0.03 to 0.01)
Resp, n=558	-0.01 (-0.03 to 0.01)
HD, n=551	-0.01 (-0.03 to 0.01)
Neu, n=508	0.00 (-0.02 to 0.02)
RA, n=501	0.02 (-0.00 to 0.04)
Ulcer, n=447	-0.01 (-0.04 to 0.01)
Dep, n=408	0.01 (-0.02 to 0.04)
DM, n=358	-0.01 (-0.04 to 0.01)
HT + Resp, n=323	-0.03 (-0.05 to 0.00)
HT + RA, n=275	-0.03 (-0.06 to 0.00)
HT + Neu, n=274	0.01 (-0.02 to 0.04)
HT + Ulcer, n=254	0.02 (-0.01 to 0.05)
Cancer, n=234	0.01 (-0.02 to 0.04)
HT + Dep, n=203	0.01 (-0.02 to 0.05)
HT + Cancer, n=137	-0.01 (-0.05 to 0.04)
HT + HD + DM, n=117	0.01 (-0.04 to 0.06)
Anemia, n=83	-0.06 (-0.11 to -0.1)
HT + Ren/Liv. n=79	-0.03 (-0.08 to 0.02)
Number of comorbidities	
1 comorbidity, n=9,441	-0.00 (-0.01 to 0.01)
2 comorbidities, n=3,838	-0.00 (-0.01 to 0.00)
3 comorbidities, n=1,173	-0.00 (-0.02 to 0.01)
≥4 comorbidities, n=392	0.00 (-0.02 to 0.03)

n: Number, CI: Confidence interval. Comor: Comorbidities, HT: Hypertension, DM: Diabetes mellitus 1 and 2, Resp: Respiratory disease, HD: Heart disease, Neu: Neurologic disease, RA: Rheumatoid arthritis, Dep: Depression, Ren/Liv: Renal and/or liver disease. *Adjusted for age, sex, BMI, educational level, not born in Denmark, civil status.

Supplementary Table S4. Sensitivity analyses excluding the confounders bodily pain, pain in other knee or hip joints, physical activity, and analgesics in the adjusted analysis for differences in change in knee and hip pain (VAS) from baseline to immediately after, and 12 months after exercise therapy and education between participants with and without comorbidities.

	Change 3 mo. VAS Mean mmm (95% CI)	Change 12 mo. VAS Mean mm (95% CI)
No comor, n=12,128	-12.7 (-13.2 to -12.2)	-13.8 (-14.3 to -13.4)
	Adjusted * difference in change at 3 months mean mm (95% CI)	**Adjusted* difference in change at 12 months** mean mm (95% CI)
HT, n=5,716	0.3 (-0.6 to 1.1)	1.3 (0.4 to 2.2)
HT + DM, n=729	1.4 (-0.6 to 3.4)	2.6 (0.4 to 4.8)
HT + HD, n=630	0.0 (-2.1 to 2.1)	1.2 (-1.2 to 3.6)
Resp, n=558	0.2 (-2.1 to 2.5)	1.6 (-1.0 to 4.1)
HD, n=551	3.6 (1.3 to 5.8)	4.0 (1.4 to 6.7)
Neu, n=508	-1.3 (-3.7 to 1.1)	-0.6 (-3.2 to 2.0)
RA, n=501	-1.1 (-3.7 to 1.4)	-0.7 (-3.4 to 2.0)
Ulcer, n=447	-1.1 (-3.8 to 1.6)	-0.2 (-3.1 to 2.7)
Dep, n=408	0.3 (-2.5 to 3.2)	2.7 (-0.8 to 6.2)
DM, n=358	0.3 (-2.5 to 3.2)	-0.5 (-3.9 to 2.8)
HT + Resp, n=323	3.1 (0.1 to 6.0)	0.5 (-3.0 to 3.9)
HT + RA, n=275	1.9 (-1.4 to 5.1)	2.4 (-1.2 to 6.0)
HT + Neu, n=274	5.0 (1.7 to 8.3)	7.1 (3.6 to 10.6)
HT + Ulcer, n=254	-0.3 (-3.8 to 3.3)	2.9 (-0.9 to 6.8)
Cancer, n=234	2.5 (-1.1 to 6.0)	2.9 (-0.8 to 6.7)
HT + Dep, n=203	-1.3 (-5.2 to 2.7)	2.4 (-2.3 to 7.0)
HT + Cancer, n=137	5.4 (0.9 to 10.0)	0.3 (-4.8 to 5.4)
HT + HD + DM, n=117	0.1 (-5.5 to 5.2)	-1.4 (-8.4 to 5.6)
Anemia, n=83	-1.2 (-7.0 to 4.6)	-2.8 (-9.1 to 3.6)
HT + Ren/Liv. n=79	-0.2 (-6.4 to 5.9)	3.1 (-3.7 to 9.8)
Number of comorbidities		
1 comorbidity, n=9,441	0.2 (-0.5 to 0.9)	1.1 (0.4 to 1.9)
2 comorbidities, n=3,838	1.4 (0.4 to 2.3)	1.9 (0.9 to 2.9)
3 comorbidities, n=1,173	0.5 (-1.1 to 2.1)	1.3 (-0.6 to 3.1)
≥4 comorbidities, n=392	2.7 (-0.1 to 5.5)	0.3 (-3.1 to 3.8)
n: Number, CI: Confidence interval. Comor: Comorbidities, HT: Hypertension, DM: Diabetes mellitus 1 and 2, Resp: Respiratory disease, HD: Heart disease, Neu: Neurologic disease, RA: Rheumatoid arthritis, Dep: Depression, Ren/Liv: Renal and/or liver disease. *Adjusted for age, sex, BMI, educational level, not born in Denmark, civil status.		

Supplementary Table S5. Sensitivity analyses excluding the confounders bodily pain, pain in other knee or hip joints, physical activity, and analgesics in the adjusted analysis for differences in change in quality of life (EQ-5D-5L) from baseline to immediately after, and 12 months after exercise therapy and education between participants with and without comorbidities.

	Change 3 mo. EQ-5D-5L Mean (95% CI)	Change 12 mo. EQ-5D-5L Mean (95% CI)
No comor, n=12,128	0.039 (0.036 to 0.041)	0.051 (0.048 to 0.053)
	Adjusted * difference in <u>change</u> at 3 months mean (95% CI)	**Adjusted* difference in <u>change</u> at 12 months** mean (95% CI)
HT, n=5,716	-0.004 (-0.008 to 0.001)	-0.008 (-0.012 to -0.003)
HT + DM, n=729	-0.007 (-0.017 to 0.004)	-0.019 (-0.031 to -0.008)
HT + HD, n=630	-0.000 (-0.011 to 0.011)	-0.023 (-0.038 to -0.009)
Resp, n=558	0.000 (-0.011 to 0.012)	-0.008 (-0.022 to 0.005)
HD, n=551	-0.014 (-0.025 to -0.003)	-0.015 (-0.029 to -0.002)
Neu, n=508	0.001 (-0.011 to 0.014)	-0.001 (-0.015 to 0.013)
RA, n=501	0.010 (-0.003 to 0.022)	-0.001 (-0.015 to 0.013)
Ulcer, n=447	0.004 (-0.010 to 0.018)	-0.010 (-0.027 to 0.006)
Dep, n=408	0.014 (-0.000 to 0.029)	0.000 (-0.017 to 0.017)
DM, n=358	-0.002 (-0.018 to 0.012)	0.010 (-0.007 to 0.027)
HT + Resp, n=323	-0.007 (-0.022 to 0.009)	-0.002 (-0.019 to 0.015)
HT + RA, n=275	-0.002 (-0.019 to 0.015)	-0.008 (-0.028 to 0.011)
HT + Neu, n=274	-0.012 (-0.030 to 0.005)	-0.032 (-0.051 to -0.012)
HT + Ulcer, n=254	-0.001 (-0.019 to 0.016)	-0.014 (-0.034 to 0.005)
Cancer, n=234	-0.008 (-0.026 to 0.010)	-0.015 (-0.033 to 0.004)
HT + Dep, n=203	0.014 (-0.008 to 0.036)	0.024 (-0.005 to 0.053)
HT + Cancer, n=137	-0.023 (-0.045 to 0.000)	-0.003 (-0.028 to 0.022)
HT + HD + DM, n=117	-0.012 (-0.039 to 0.016)	0.022 (-0.010 to 0.054)
Anemia, n=83	-0.002 (-0.032 to 0.029)	0.010 (-0.023 to 0.043)
HT + Ren/Liv. n=79	0.002 (-0.030 to 0.034)	-0.001 (-0.036 to 0.035)
Number of comorbidities		
1 comorbidity, n=9,441	-0.002 (-0.005 to 0.002)	-0.006 (-0.010 to -0.002)
2 comorbidities, n=3,838	-0.002 (-0.007 to 0.003)	-0.011 (-0.017 to -0.006)
3 comorbidities, n=1,173	-0.006 (-0.015 to 0.003)	-0.014 (-0.024 to -0.003)
≥4 comorbidities, n=392	0.005 (-0.011 to 0.022)	-0.004 (-0.024 to 0.017)

n: Number, CI: Confidence interval. Comor: Comorbidities, HT: Hypertension, DM: Diabetes mellitus 1 and 2, Resp: Respiratory disease, HD: Heart disease, Neu: Neurologic disease, RA: Rheumatoid arthritis, Dep: Depression, Ren/Liv: Renal and/or liver disease. *Adjusted for age, sex, BMI, educational level, not born in Denmark, civil status.

Supplementary Table S6. Sensitivity analyses using only individuals with complete data at all time points (complete-case analysis) for 40-meter Fast-Paced Walk Test (40-m FPWT) differences at baseline, and changes immediately after exercise therapy and education in between participants with and without comorbidities.

	Baseline 40-m FPWT Mean m/s (95% CI)	3 mo. 40-m FPWT Mean m/s (95% CI)	Change 3 mo. 40-m FPWT Mean m/s (95% CI)
No comor, n=7,840	1.57 (1.56 to 1.57)	1.69 (1.68 to 1.70)	0.13 (0.12 to 0.13)
	Difference at <u>baseline</u>	**Difference in <u>change</u> at 3 months**	
	Mean m/s (95% CI)	Unadjusted mean m/s (95% CI)	Adjusted* mean m/s (95% CI)
HT, n=3,772	-0.11 (-0.12 to -0.10)	-0.00 (-0.01 to 0.01)	-0.00 (-0.01 to 0.01)
HT + DM, n=470	-0.20 (-0.23 to -0.18)	-0.00 (-0.02 to 0.01)	0.00 (-0.02 to 0.02)
HT + HD, n=391	-0.16 (-0.19 to -0.13)	-0.02 (-0.04 to 0.00)	-0.02 (-0.04 to 0.00)
Resp, n=361	-0.05 (-0.08 to -0.02)	-0.01 (-0.03 to 0.01)	-0.01 (-0.03 to 0.01)
HD, n=339	-0.08 (-0.12 to -0.05)	-0.01 (-0.04 to 0.02)	-0.02 (-0.04 to 0.01)
Neu, n=318	-0.06 (-0.09 to -0.03)	0.00 (-0.02 to 0.02)	0.00 (-0.02 to 0.02)
RA, n=292	-0.05 (-0.09 to -0.01)	0.02 (-0.00 to 0.04)	0.02 (-0.00 to 0.04)
Ulcer, n=264	-0.04 (-0.08 to -0.01)	-0.01 (-0.03 to 0.01)	-0.01 (-0.03 to 0.01)
Dep, n=225	-0.08 (-0.12 to -0.04)	0.01 (-0.01 to 0.04)	0.01 (-0.01 to 0.04)
DM, n=213	-0.12 (-0.16 to -0.08)	-0.01 (-0.04 to 0.01)	-0.01 (-0.04 to 0.01)
HT + Resp, n=193	-0.20 (-0.25 to -0.16)	-0.03 (-0.05 to 0.00)	-0.03 (-0.06 to -0.00)
HT + RA, n=172	-0.14 (-0.18 to -0.09)	-0.03 (-0.06 to 0.00)	-0.03 (-0.06 to 0.00)
HT + Neu, n=159	-0.14 (-0.19 to -0.09)	0.00 (-0.03 to 0.04)	0.01 (-0.03 to 0.04)
HT + Ulcer, n=145	-0.15 (-0.20 to -0.10)	0.02 (-0.01 to 0.05)	0.02 (-0.01 to 0.05)
Cancer, n=132	-0.03 (-0.08 to -0.03)	0.01 (-0.03 to 0.04)	0.01 (-0.03 to 0.04)
HT + Dep, n=111	-0.18 (-0.264to -0.12)	0.01 (-0.02 to 0.05)	0.01 (-0.02 to 0.05)
HT + Cancer, n=82	-0.15 (-0.22 to -0.08)	-0.01 (-0.05 to 0.03)	-0.01 (-0.05 to 0.03)
HT + HD + DM, n=62	-0.19 (-0.27 to -0.12)	-0.00 (-0.05 to 0.05)	-0.00 (-0.05 to 0.05)
Anemia, n=47	-0.02 (-0.07 to 0.11)	-0.05 (-0.10 to 0.01)	-0.05 (-0.10 to 0.01)
HT + Ren/Liv. n=46	-0.06 (-0.15 to -0.03)	-0.02 (-0.08 to 0.04)	-0.02 (-0.08 to 0.04)
Number of comorbidities			
1 comorbidity, n=6,016	-0.09 (-0.10 to -0.8)	-0.00 (-0.01 to 0.01)	-0.00 (-0.01 to 0.01)
2 comorbidities, n=2,285	-0.17 (-0.18 to -0.15)	-0.01 (-0.02 to 0.00)	-0.01 (-0.02 to 0.00)
3 comorbidities, n=680	-0.21 (-0.24 to -0.19)	-0.00 (-0.02 to 0.01)	-0.00 (-0.02 to 0.01)
≥4 comorbidities, n=208	-0.29 (-0.33 to -0.25)	0.01 (-0.02 to 0.03)	0.01 (-0.02 to 0.04)

n: Number, CI: Confidence interval. Comor: Comorbidities, HT: Hypertension, DM: Diabetes mellitus 1 and 2, Resp: Respiratory disease, HD: Heart disease, Neu: Neurologic disease, RA: Rheumatoid arthritis, Dep: Depression, Ren/Liv: Renal and/or liver disease. *Adjusted for age, sex, BMI, educational level, not born in Denmark, civil status, physical activity, problems in other joints, use of analgesics, and number of bodily pain areas.

Supplementary Table S7. Sensitivity analyses using only individuals with complete data at all time points (complete-case analysis) for knee and hip pain (VAS) differences at baseline, and changes immediately after, and 12 months after exercise therapy and education between participants with and without comorbidities.

	Baseline VAS Mean mm (95% CI)	3 mo. VAS Mean mm (95% CI)	Change 3 mo. VAS Mean mmm (95% CI)	12 mo. VAS Mean mm (95% CI)	Change 12 mo. VAS Mean mm (95% CI)
No comor, n=6,954	44.8 (44.3 to 45.3)	31.8 (31.3 to 32.3)	-13.0 (-13.6 to -12.5)	31.3 (30.8 to 31.8)	-13.5 (-14.1 to -12.9)
	Difference at <u>baseline</u>	**Difference in <u>change</u> at 3 months**		**Difference in <u>change</u> at 12 months**	
	Mean mm (95% CI)	Unadjusted mean mm (95% CI)	Adjusted* mean mm (95% CI)	Unadjusted mean mm (95% CI)	Adjusted* mean mm (95% CI)
HT, n=3,219	2.2 (1.3 to 3.1)	0.0 (-1.0 to 1.0)	-0.0 (-1.0 to 1.0)	0.6 (-0.4 to 1.7)	0.6 (-0.4 to 1.7)
HT + DM, n=382	3.6 (1.3 to 5.9)	1.7 (-0.9 to 4.1)	1.5 (-1.0 to 4.1)	2.8 (0.3 to 5.3)	2.9 (0.4 to 5.5)
HT + HD, n=331	2.6 (0.1 to 5.0)	0.1 (-2.6 to 2.8)	0.1 (-2.6 to 2.7)	1.3 (-1.4 to 4.0)	1.3 (-1.4 to 4.0)
Resp, n=321	3.0 (0.5 to 5.5)	-0.8 (-3.6 to 1.9)	-0.8 (-3.6 to 1.9)	0.5 (-2.2 to 3.2)	0.5 (-2.2 to 3.2)
HD, n=300	-0.7 (-3.3 to 1.8)	4.3 (1.5 to 7.1)	4.3 (1.5 to 7.1)	4.2 (1.4 to 7.0)	4.2 (1.4 to 7.0)
Neu, n=282	4.2 (1.5 to 6.8)	-0.8 (-3.7 to 2.1)	-0.6 (-3.5 to 2.3)	-0.4 (-3.3 to 2.5)	-0.5 (-3.4 to 2.4)
RA, n=253	2.3 (-0.5 to 5.1)	-1.3 (-4.3 to 1.8)	-1.3 (-4.3 to 1.8)	-1.6 (-4.6 to 1.5)	-1.6 (-4.6 to 1.5)
Ulcer, n=238	4.5 (1.7 to 7.4)	-0.9 (-4.1 to 2.2)	-0.9 (-4.1 to 2.2)	-0.0 (-3.2 to 3.1)	-0.0 (-3.2 to 3.1)
Dep, n=174	5.9 (2.6 to 9.3)	0.1 (-3.5 to 3.8)	0.1 (-3.5 to 3.8)	2.4 (-1.2 to 6.1)	2.4 (-1.2 to 6.1)
DM, n=184	2.2 (-1.0 to 5.4)	1.7 (-1.8 to 5.3)	1.8 (-1.8 to 5.3)	0.6 (-3.0 to 4.1)	0.6 (-3.0 to 4.1)
HT + Resp, n=145	3.3 (-0.4 to 6.9)	2.0 (-1.9 to 6.0)	2.1 (-1.9 to 6.1)	-0.1 (-4.1 to 3.9)	-0.1 (-4.1 to 3.9)
HT + RA, n=142	5.7 (2.0 to 9.4)	0.9 (-3.2 to 4.9)	0.8 (-3.2 to 4.9)	0.9 (-3.1 to 5.0)	0.9 (-3.1 to 5.0)
HT + Neu, n=139	-0.6 (-4.3 to 3.1)	7.0 (2.9 to 11.1)	6.9 (2.8 to 11.0)	8.5 (4.4 to 12.6)	8.3 (4.2 to 12.4)
HT + Ulcer, n=141	6.4 (2.7 to 10.0)	0.9 (-3.2 to 4.9)	1.1 (-2.9 to 5.2)	3.3 (-0.8 to 7.3)	3.4 (-0.7 to 7.5)
Cancer, n=137	3.2 (-0.6 to 6.9)	2.7 (-1.4 to 6.8)	2.7 (-1.4 to 6.8)	1.9 (-2.2 to 6.0)	1.9 (-2.2 to 6.1)
HT + Dep, n=78	7.5 (2.5 to 12.4)	-2.7 (-8.2 to 2.7)	-2.7 (-8.1 to 2.7)	0.6 (-4.8 to 6.0)	0.6 (-4.8 to 6.1)
HT + Cancer, n=71	1.9 (-3.3 to 7.0)	5.6 (-0.1 to 11.3)	5.6 (-0.1 to 11.3)	-0.6 (-6.2 to 5.1)	-0.6 (-6.2 to 5.1)
HT + HD + DM, n=45	5.3 (-1.2 to 11.8)	-1.4 (-8.5 to 5.7)	-1.4 (-8.5 to 5.7)	-4.0 (-11.2 to 3.1)	-4.0 (-11.2 to 3.1)
Anemia, n=45	1.6 (-4.8 to 8.1)	-3.5 (-10.6 to 3.7)	-3.4 (-10.6 to 3.7)	-3.7 (-10.8 to 3.4)	-3.7 (-10.8 to 3.4)
HT + Ren/Liv. n=42	3.2 (-3.5 to 10.)	1.0 (-6.4 to 8.8)	1.0 (-6.4 to 8.3)	1.4 (-5.9 to 8.8)	1.4 (-5.9 to 8.8)
Number of comorbidities					
1 comorbidity, n=5,198	2.4 (1.6 to 3.2)	0.2 (-0.7 to 1.0)	0.2 (-0.7 to 1.0)	0.7 (-0.2 to 1.5)	0.7 (-0.2 to 1.5)
2 comorbidities, n=1,885	3.7 (2.6 to 4.9)	1.5 (0.3 to 2.8)	1.5 (0.3 to 2.8)	1.9 (0.7 to 3.2)	1.9 (0.7 to 3.2)
3 comorbidities, n=545	6.7 (4.8 to 8.7)	0.5 (-1.7 to 2.6)	0.5 (-1.6 to 2.6)	1.1 (-1.0 to 3.3)	1.2 (-0.9 to 3.3)
≥4 comorbidities, n=166	9.0 (5.6 to 12.4)	4.7 (0.9 to 8.4)	4.9 (1.15 to 8.7)	1.7 (-2.0 to 5.5)	1.9 (-1.9 to 5.6)

n: Number, CI: Confidence interval. Comor: Comorbidities, HT: Hypertension, DM: Diabetes mellitus 1 and 2, Resp: Respiratory disease, HD: Heart disease, Neu: Neurologic disease, RA: Rheumatoid arthritis, Dep: Depression, Ren/Liv: Renal and/or liver disease. *Adjusted for age, sex, BMI, educational level, not born in Denmark, civil status, physical activity, problems in other joints, use of analgesics, and number of bodily pain areas.

Supplementary Table S8. Sensitivity analyses using only individuals with complete data at all time points (complete-case analysis) for quality of life (EQ-5D-5L) differences at baseline, and changes immediately after, and 12 months after exercise therapy and education between participants with and without comorbidities.

	Baseline EQ-5D-5L Mean (95% CI)	3 mo. EQ-5D-5L Mean (95% CI)	Change 3 mo. EQ-5D-5L Mean (95% CI)	12 mo. EQ-5D-5L Mean (95% CI)	Change 12 mo. EQ-5D-5L Mean (95% CI)
No comor, n=6,958	0.730 (0.728 to 0.733)	0.770 (0.768 to 0.773)	0.040 (0.037 to 0.043)	0.781 (0.778 to 0.784)	0.050 (0.047 to 0.053)
	Difference at <u>baseline</u>	**Difference in <u>change</u> at 3 months**		**Difference in <u>change</u> at 12 months**	
	Mean (95% CI)	Unadjusted mean (95% CI)	Adjusted* mean (95% CI)	Unadjusted mean (95% CI)	Adjusted* mean (95% CI)
HT, n=3,222	-0.008 (-0.013 to -0.003)	-0.004 (-0.009 to 0.001)	-0.004 (-0.009 to 0.001)	-0.007 -(0.012 to -0.002)	-0.007 (-0.012 to -0.002)
HT + DM, n=382	-0.019 (-0.031 to -0.007)	-0.009 (-0.020 to 0.004)	-0.007 (-0.020 to 0.005)	-0.019 (-0.032 to -0.007)	-0.020 (-0.033 to -0.008)
HT + HD, n=331	-0.022 (-0.034 to -0.009)	0.001 (-0.013 to 0.014)	0.001 (-0.013 to 0.014)	-0.020 (-0.033 to -0.007)	-0.020 (-0.033 to -0.007)
Resp, n=321	-0.018 (-0.032 to -0.005)	0.003 (-0.010 to 0.017)	0.003 (-0.010 to 0.017)	-0.005 (-0.018 to 0.009)	-0.005 (-0.018 to 0.009)
HD, n=299	-0.004 (-0.018 to 0.009)	- 0.016 (-0.030 to -0.002)	- 0.016 (-0.030 to -0.002)	-0.015 (-0.029 to -0.001)	-0.015 (-0.029 to -0.001)
Neu, n=282	-0.025 (-0.039 to -0.011)	0.002 (-0.013 to 0.016)	0.001 (-0.013 to 0.016)	-0.002 (-0.017 to 0.012)	-0.002 (-0.017 to 0.012)
RA, n=252	-0.024 (-0.038 to -0.009)	0.007 (-0.008 to 0.022)	0.007 (-0.008 to 0.022)	-0.001 (-0.016 to 0.014)	-0.001 (-0.016 to 0.014)
Ulcer, n=239	-0.027 (-0.042 to -0.012)	0.004 (-0.011 to 0.020)	0.004 (-0.011 to 0.020)	-0.008 (-0.023 to 0.008)	-0.008 (-0.023 to 0.008)
Dep, n=175	-0.097 (-0.114 to -0.079)	0.012 (-0.007 to 0.030)	0.012 (-0.007 to 0.030)	-0.004 (-0.022 to 0.014)	-0.004 (-0.022 to 0.015)
DM, n=184	-0.014 (-0.031 to 0.004)	-0.010 (-0.028 to 0.008)	-0.010 (-0.028 to 0.008)	0.004 (-0.014 to 0.022)	0.004 (-0.014 to 0.022)
HT + Resp, n=145	-0.024 (-0.043 to -0.005)	-0.007 (-0.027 to 0.013)	-0.007 (-0.027 to 0.013)	0.002 (-0.018 to 0.022)	0.002 (-0.018 to 0.022)
HT + RA, n=142	-0.031 (-0.051 to -0.012)	-0.001 (-0.021 to 0.019)	-0.000 (-0.020 to 0.020)	-0.004 (-0.024 to 0.016)	-0.005 (-0.025 to 0.015)
HT + Neu, n=139	-0.010 (-0.029 to 0.010)	-0.013 (-0.033 to 0.008)	-0.012 (-0.033 to 0.007)	-0.027 (-0.047 to -0.006)	-0.027 (-0.047 to -0.007)
HT + Ulcer, n=141	-0.030 (-0.050 to -0.012)	-0.002 (-0.022 to 0.018)	-0.002 (-0.022 to 0.018)	-0.012 (-0.032 to 0.008)	-0.012 (-0.032 to 0.008)
Cancer, n=137	-0.025 (-0.045 to -0.005)	-0.013 (-0.033 to 0.007)	-0.013 (-0.033 to 0.007)	-0.014 (-0.034 to 0.006)	-0.014 (-0.034 to 0.006)
HT + Dep, n=79	-0.103 (-0.129 to -0.077)	0.016 (-0.010 to 0.043)	0.016 (-0.010 to 0.043)	0.032 (0.005 to 0.058)	0.032 (0.005 to 0.058)
HT + Cancer, n=71	-0.007 (-0.034 to 0.021)	-0.028 (-0.056 to 0.000)	-0.028 (-0.056 to 0.000)	-0.004 (-0.033 to 0.024)	-0.004 (-0.033 to 0.024)
HT + HD + DM, n=47	-0.043 (-0.077 to -0.009)	0.002 -0.032 to 0.036)	0.002 -0.032 to 0.036)	0.040 (0.006 to 0.074)	0.040 (0.006 to 0.074)
Anemia, n=45	0.006 (-0.028 to 0.040)	0.001 (-0.034 to 0.037)	0.001 (-0.034 to 0.037)	0.011 (-0.024 to 0.046)	0.011 (-0.024 to 0.046)
HT + Ren/Liv. n=41	-0.033 (-0.070 to 0.003)	0.005 (-0.032 to 0.042)	0.005 (-0.032 to 0.042)	0.014 (-0.022 to 0.051)	0.014 (-0.022 to 0.051)
Number of comorbidities					
1 comorbidity, n=5,201	-0.014 (-0.019 to -0.010)	-0.003 (-0.007 to 0.001)	-0.003 (-0.007 to 0.001)	-0.006 (-0.011 to -0.002)	-0.006 (-0.010 to -0.002)
2 comorbidities, n=1,887	-0.030 (-0.036 to -0.023)	-0.005 (-0.011 to 0.001)	-0.005 (-0.011 to 0.001)	-0.012 (-0.018 to -0.005)	-0.012 (-0.018 to -0.006)
3 comorbidities, n=549	-0.050 (-0.061 to -0.040)	-0.005 (-0.016 to 0.005)	-0.005 (-0.016 to 0.005)	-0.013 (-0.023 to -0.002)	-0.013 (-0.024 to -0.002)
≥4 comorbidities, n=166	-0.096 (-0.115 to -0.078)	-0.007 (-0.025 to 0.015)	-0.004 (-0.023 to 0.014)	-0.007 (-0.025 to 0.012)	-0.007 (-0.025 to 0.012)

n: Number, CI: Confidence interval. Comor: Comorbidities, HT: Hypertension, DM: Diabetes mellitus 1 and 2, Resp: Respiratory disease, HD: Heart disease, Neu: Neurologic disease, RA: Rheumatoid arthritis, Dep: Depression, Ren/Liv: Renal and/or liver disease. *Adjusted for age, sex, BMI, educational level, not born in Denmark, civil status, physical activity, problems in other joints, use of analgesics, and number of bodily pain areas.

Supplementary Table S9. Sensitivity analyses with stratification for most affected joint in the adjusted analysis for difference in change in 40-meter Fast-Paced Walk Test (40-m FPWT) from baseline to immediately after exercise therapy and education in between participants with and without comorbidities.

	Knee (n=18,271)	Hip (n=6,242)
	Change 3 mo. 40-m FPWT Mean m/s (95% CI)	Change 3 mo. 40-m FPWT Mean m/s (95% CI)
No comor, n=12,128	0.13 (0.12 to 0.13)	0.11 (0.10 to 0.12)
	Adjusted* difference in <u>change</u> at 3 months Mean m/s (95% CI)	Adjusted* difference in <u>change</u> at 3 months Mean m/s (95% CI)
HT, n=5,716	-0.00 (-0.01 to 0.01)	-0.01 (-0.02 to 0.01)
HT + DM, n=729	0.00 (-0.02 to 0.02)	0.00 (-0.04 to 0.04)
HT + HD, n=630	-0.01 (-0.03 to 0.01)	-0.02 (-0.06 to 0.01)
Resp, n=558	-0.00 (-0.03 to 0.02)	-0.02 (-0.06 to 0.01)
HD, n=551	-0.02 (-0.04 to 0.00)	0.00 (-0.04 to 0.04)
Neu, n=508	0.01 (-0.02 to 0.03)	-0.00 (-0.04 to 0.04)
RA, n=501	0.02 (-0.01 to 0.04)	0.02 (-0.02 to 0.07)
Ulcer, n=447	-0.01 (-0.04 to 0.01)	-0.00 (-0.05 to 0.04)
Dep, n=408	0.01 (-0.02 to 0.04)	0.01 (-0.04 to 0.06)
DM, n=358	-0.01 (-0.04 to 0.01)	-0.03 (-0.08 to 0.03)
HT + Resp, n=323	-0.03 (-0.06 to 0.00)	-0.03 (-0.08 to 0.02)
HT + RA, n=275	-0.03 (-0.07 to 0.01)	-0.03 (-0.09 to 0.03)
HT + Neu, n=274	0.01 (-0.03 to 0.04)	0.01 (-0.04 to 0.07)
HT + Ulcer, n=254	0.02 (-0.01 to 0.05)	0.02 (-0.04 to 0.07)
Cancer, n=234	0.01 (-0.03 to 0.04)	0.03 (-0.03 to 0.09)
HT + Dep, n=203	0.02 (-0.02 to 0.05)	-0.00 (-0.07 to 0.07)
HT + Cancer, n=137	-0.01 (-0.06 to 0.04)	0.01 (-0.07 to 0.08)
HT + HD + DM, n=117	0.00 (-0.05 to 0.06)	0.03 (-0.06 to 0.12)
Anemia, n=83	-0.07 (-0.12 to -0.01)	-0.04 (-0.15 to 0.08)
HT + Ren/Liv. n=79	-0.02 (-0.09 to 0.04)	-0.06 (-0.15 to 0.04)
Number of comorbidities		
1 comorbidity, n=9,441	-0.00 (-0.01 to 0.01)	-0.00 (-0.01 to 0.01)
2 comorbidities, n=3,838	-0.00 (-0.01 to 0.01)	-0.01 (-0.03 to 0.01)
3 comorbidities, n=1,173	-0.00 (-0.02 to 0.01)	0.00 (-0.03 to 0.03)
≥4 comorbidities, n=392	0.00 (-0.03 to 0.03)	0.02 (-0.03 to 0.07)
n: Number, CI: Confidence interval. Comor: Comorbidities, HT: Hypertension, DM: Diabetes mellitus 1 and 2, Resp: Respiratory disease, HD: Heart disease, Neu: Neurologic disease, RA: Rheumatoid arthritis, Dep: Depression, Ren/Liv: Renal and/or liver disease. *Adjusted for age, sex, BMI, educational level, not born in Denmark, civil status.		

Supplementary Table S10. Sensitivity analyses with stratification for most affected joint in the adjusted analysis for differences in change in knee and hip pain (VAS) from baseline to immediately after, and 12 months after exercise therapy and education between participants with and without comorbidities.

	Knee (n=18,271)		Hip (n=6,242)	
	Change 3 mo. VAS Mean mmm (95% CI)	**Change 12 mo. VAS** Mean mm (95% CI)	**Change 3 mo. VAS** Mean mmm (95% CI)	**Change 12 mo. VAS** Mean mm (95% CI)
No comor, n=12,128	-13.3 (-13.9 to -12.7)	-14.0 (-14.6 to -13.4)	-11.0 (-12.0 to -10.1)	-13.4 (-14.5 to -12.3)
	Adjusted * difference in change at 3 months mean mm (95% CI)	**Adjusted* difference in change at 12 months** mean mm (95% CI)	**Adjusted * difference in change at 3 months** mean mm (95% CI)	**Adjusted* difference in change at 12 months** mean mm (95% CI)
HT, n=5,716	0.5 (-0.5 to 1.5)	1.5 (0.5 to 2.5)	-0.2 (-2.0 to 1.5)	0.5 (-1.4 to 2.4)
HT + DM, n=729	1.3 (-1.0 to 3.6)	2.3 (-0.2 to 4.7)	2.3 (-2.1 to 6.6)	3.9 (-0.5 to 8.3)
HT + HD, n=630	-0.4 (-2.8 to 2.0)	0.5 (-2.1 to 3.2)	1.3 (-3.1 to 5.6)	3.2 (-1.5 to 7.9)
Resp, n=558	-0.2 (-2.7 to 2.6)	1.3 (-1.7 to 4.3)	0.7 (-3.7 to 5.0)	2.2 (-2.5 to 6.9)
HD, n=551	3.8 (1.2 to 6.4)	4.9 (2.0 to 7.8)	2.9 (-1.7 to 7.6)	1.9 (-3.5 to 6.3)
Neu, n=508	-1.4 (-4.1 to 1.3)	-0.3 (-3.4 to 2.8)	-1.1 (-5.9 to 3.6)	-1.3 (-6.3 to 3.6)
RA, n=501	-1.2 (-4.2 to 1.7)	-0.2 (-3.3 to 3.0)	-1.0 (-5.8 to 3.8)	-2.0 (-6.9 to 2.9)
Ulcer, n=447	-0.7 (-3.6 to 2.3)	-1.1 (-4.4 to 2.1)	-2.2 (-7.5 to 3.1)	2.6 (-3.1 to 8.3)
Dep, n=408	-0.6 (-3.7 to 2.5)	2.3 (-1.6 to 6.2)	3.3 (-2.5 to 9.0)	4.1 (-2.1 to 10.2)
DM, n=358	0.1 (-3.1 to 3.3)	-1.4 (-5.0 to 2.2)	2.0 (-4.4 to 8.3)	3.0 (-4.1 to 10.0)
HT + Resp, n=323	3.4 (-0.0 to 6.7)	1.4 (-2.4 to 5.2)	2.0 (-4.1 to 8.1)	-2.5 (-9.3 to 4.4)
HT + RA, n=275	2.7 (-1.0 to 6.3)	2.4 (-1.8 to 6.5)	-0.4 (-7.0 to 6.2)	2.5 (-4.7 to 9.8)
HT + Neu, n=274	5.7 (2.1 to 9.3)	7.8 (3.9 to 11.7)	3.2 (-3.7 to 10.1)	5.1 (-2.3 to 12.5)
HT + Ulcer, n=254	-0.3 (-4.3 to 3.6)	3.5 (-0.7 to 7.6)	-0.1 (-6.7 to 6.5)	1.4 (-6.3 to 9.0)
Cancer, n=234	1.7 (-2.4 to 5.8)	2.7 (-1.6 to 7.0)	5.0 (-2.0 to 11.9)	3.7 (-3.7 to 11.0)
HT + Dep, n=203	-0.8 (-5.1 to 3.5)	1.9 (-3.2 to 7.1)	-2.7 (-11.7 to 6.4)	3.9 (-5.2 to 13.0)
HT + Cancer, n=137	6.0 (0.7 to 11.3)	2.3 (-3.3 to 8.0)	3.8 (-5.2 to 12.9)	-5.7 (-15.2 to 3.9)
HT + HD + DM, n=117	-3.7 (-10.0 to 2.6)	-3.5 (-11.0 to 4.1)	8.8 (-1.9 to 19.4)	4.0 (-8.3 to 16.2)
Anemia, n=83	-0.8 (-7.3 to 5.6)	-2.5 (-9.5 to 4.4)	-1.9 (-14.9 to 11.1)	-3.4 (-17.4 to 10.6)
HT + Ren/Liv. n=79	-0.5 (-7.6 to 6.6)	3.1 (-4.3 to 10.5)	0.6 (-11.4 to 12.5)	2.9 (-9.5 to 15.4)
Number of comorbidities				
1 comorbidity, n=9,441	0.3 (-0.5 to 1.2)	1.3 (0.4 to 2.1)	0.1 (-1.4 to 1.5)	0.7 (-0.8 to 2.3)
2 comorbidities, n=3,838	1.5 (0.5 to 2.6)	2.0 (0.8 to 3.1)	1.1 (-1.0 to 3.2)	1.9 (-0.2 to 4.0)
3 comorbidities, n=1,173	0.7 (-1.2 to 2.6)	1.2 (-0.8 to 3.3)	0.1 (-3.2 to 3.3)	1.4 (-2.2 to 5.0)
≥4 comorbidities, n=392	3.1 (-0.1 to 6.3)	0.7 (-3.1 to 4.4)	1.6 (-4.4 to 7.5)	-0.7 (-7.3 to 6.0)

n: Number, CI: Confidence interval. Comor: Comorbidities, HT: Hypertension, DM: Diabetes mellitus 1 and 2, Resp: Respiratory disease, HD: Heart disease, Neu: Neurologic disease, RA: Rheumatoid arthritis, Dep: Depression, Ren/Liv: Renal and/or liver disease.
*Adjusted for age, sex, BMI, educational level, not born in Denmark, civil status.

Supplementary Table S11. Sensitivity analyses with stratification for most affected joint in the adjusted analysis for differences in change in quality of life (EQ-5D-5L) from baseline to immediately after, and 12 months after exercise therapy and education between participants with and without comorbidities.

	Knee (n=18,271)		Hip (n=6,242)	
	Change 3 mo. EQ-5D-5L Mean (95% CI)	Change 12 mo. EQ-5D-5L Mean (95% CI)	Change 3 mo. EQ-5D-5L Mean (95% CI)	Change 12 mo. EQ-5D-5L Mean (95% CI)
No comor, n=12,128	0.042 (0.039 to 0.045)	0.052 (0.049 to 0.055)	0.30 (0.25 to 0.35)	0.47 (0.41 to 0.052)
	Adjusted * difference in **change** at 3 months mean (95% CI)	Adjusted* difference in **change** at 12 months mean (95% CI)	Adjusted * difference in **change** at 3 months mean (95% CI)	Adjusted* difference in **change** at 12 months mean (95% CI)
HT, n=5,716	-0.005 (-0.010 to 0.000)	-0.009 (-0.014 to -0.004)	-0.002 (-0.011 to 0.007)	-0.004 (-0.014 to -0.006)
HT + DM, n=729	-0.007 (-0.018 to 0.005)	-0.016 -(0.028 to 0.003)	-0.008 (-0.031 to 0.015)	-0.031 -(0.057 to 0.005)
HT + HD, n=630	0.005 (-0.008 to 0.018)	-0.021 (-0.036 to -0.006)	-0.015 (-0.037 to 0.007)	-0.029 (-0.056 to -0.003)
Resp, n=558	0.004 (-0.009 to 0.017)	-0.007 (-0.022 to 0.009)	-0.008 (-0.030 to 0.015)	-0.013 (-0.037 to 0.012)
HD, n=551	- 0.018 (-0.031 to -0.005)	-0.019 (-0.033 to -0.004)	- 0.014 (-0.025 to 0.022)	-0.006 (-0.025 to 0.022)
Neu, n=508	0.002 (-0.013 to 0.017)	-0.001 (-0.016 to 0.015)	0.000 (-0.024 to 0.025)	-0.001 (-0.027 to 0.025)
RA, n=501	0.005 (-0.010 to 0.019)	-0.003 (-0.019 to 0.013)	0.024 (-0.001 to 0.050)	0.004 (-0.022 to 0.031)
Ulcer, n=447	0.004 (-0.012 to 0.020)	-0.009 (-0.027 to 0.010)	0.004 (-0.025 to 0.033)	-0.016 (-0.046 to 0.013)
Dep, n=408	0.017 (0.001 to 0.034)	0.002 (-0.017 to 0.020)	0.005 (-0.025 to 0.035)	-0.005 (-0.025 to 0.035)
DM, n=358	0.000 (-0.016 to 0.016)	0.013 (-0.005 to 0.032)	-0.017 (-0.051 to 0.016)	-0.005 (-0.042 to 0.033)
HT + Resp, n=323	-0.003 (-0.020 to 0.014)	-0.003 (-0.022 to 0.017)	-0.018 (-0.050 to 0.013)	0.000 (-0.037 to 0.037)
HT + RA, n=275	-0.007 (-0.025 to 0.011)	-0.016 (-0.036 to 0.005)	0.012 (-0.026 to 0.049)	0.014 (-0.027 to 0.056)
HT + Neu, n=274	-0.015 (-0.034 to 0.004)	-0.036 (-0.056 to -0.015)	-0.003 (-0.040 to 0.033)	-0.020 (-0.062 to -0.022)
HT + Ulcer, n=254	-0.004 (-0.023 to 0.015)	-0.016 (-0.039 to 0.006)	0.048 (-0.031 to 0.041)	-0.009 (-0.051 to 0.034)
Cancer, n=234	-0.011 (-0.032 to 0.010)	-0.018 (-0.039 to 0.003)	0.001 (-0.036 to 0.038)	-0.005 (-0.043 to 0.033)
HT + Dep, n=203	0.008 (-0.016 to 0.032)	0.020 (-0.010 to 0.051)	0.032 (-0.021 to 0.084)	0.034 (-0.018 to 0.087)
HT + Cancer, n=137	-0.016 (-0.042 to 0.009)	-0.006 (-0.035 to 0.023)	-0.042 (-0.091 to 0.007)	0.007 (-0.044 to 0.058)
HT + HD + DM, n=117	-0.008 -0.039 to 0.024)	-0.026 (-0.010 to 0.063)	-0.021 -0.073 to 0.031)	0.010 (-0.053 to 0.072)
Anemia, n=83	-0.000 (-0.033 to 0.032)	0.019 (-0.017 to 0.055)	-0.009 (-0.079 to 0.060)	-0.021 (-0.101 to 0.058)
HT + Ren/Liv. n=79	0.006 (-0.032 to 0.043)	0.009 (-0.030 to 0.049)	-0.008 (-0.070 to 0.055)	-0.029 (-0.096 to 0.039)
Number of comorbidities				
1 comorbidity, n=9,441	-0.002 (-0.007 to 0.002)	-0.007 (-0.012 to -0.002)	-0.000 (-0.008 to 0.007)	-0.004 (-0.012 to 0.004)
2 comorbidities, n=3,838	-0.002 (-0.008 to 0.003)	-0.012 (-0.019 to -0.005)	-0.002 (-0.013 to 0.009)	-0.011 (-0.022 to 0.000)
3 comorbidities, n=1,173	-0.011 (-0.021 to -0.001)	-0.017 (-0.029 to -0.005)	0.009 (-0.009 to 0.026)	-0.004 8-0.024 to 0.017)
≥4 comorbidities, n=392	0.005 (-0.013 to 0.024)	-0.004 (-0.026 to 0.019)	0.004 (-0.031 to 0.038)	-0.004 (-0.038 to 0.030)

n: Number, CI: Confidence interval. Comor: Comorbidities, HT: Hypertension, DM: Diabetes mellitus 1 and 2, Resp: Respiratory disease, HD: Heart disease, Neu: Neurologic disease, RA: Rheumatoid arthritis, Dep: Depression, Ren/Liv: Renal and/or liver disease.
*Adjusted for age, sex, BMI, educational level, not born in Denmark, civil status.

Supplementary Table S12. Sensitivity analyses using only individuals with complete data at all time points (complete-case analysis) for estimating relative risks (RR) for not adhering to ten or more exercise sessions during an exercise therapy and education program for individuals with comorbidities compared to individuals without comorbidities.

	Attending <10 exercise sessions, n (%)	Unadjusted RR (95% CI)	Adjusted* RR (95% CI)
No comor, n=8,157	1,425 (17)	1 (reference)	1 (reference)
HT, n=3,917	616 (16)	0.90 (0.83 to 0.98)	1.00 (0.92 to 1.09)
HT + DM, n=498	60 (12)	0.69 (0.54 to 0.88)	0.77 (0.60 to 0.98)
HT + HD, n=415	62 (15)	0.86 (0.68 to 1.08)	1.01 (0.80 to 1.28)
Resp, n=375	64 (17)	0.98 (0.78 to 1.23)	1.05 (0.84 to 1.32)
HD, n=363	52 (14)	0.82 (0.63 to 1.06)	0.95 (0.74 to 1.22)
Neu, n=333	59 (18)	1.01 (0.80 to 1.28)	1.03 (0.81 to 1.30)
RA, n=305	56 (18)	1.05 (0.83 to 1.34)	1.07 (0.84 to 1.36)
Ulcer, n=276	50 (18)	1.04 (0.80 to 1.34)	1.03 (0.80 to 1.34)
Dep, n=231	50 (22)	1.24 (0.97 to 1.59)	1.13 (0.87 to 1.46)
DM, n=218	48 (22)	1.26 (0.98 to 1.63)	1.34 (1.04 to 1.73)
HT + Resp, n=202	35 (17)	0.99 (0.73 to 1.35)	1.18 (0.88 to 1.59)
HT + RA, n=171	32 (19)	1.07 (0.78 to 1.47)	1.18 (0.86 to 1.62)
HT + Neu, n=163	30 (18)	1.05 (0.76 to 1.46)	1.20 (0.87 to 1.65)
HT + Ulcer, n=151	18 (12)	0.68 (0.44 to 1.06)	0.82 (0.53 to 1.25)
Cancer, n=140	21 (15)	0.86 (0.58 to 1.28)	0.95 (0.64 to 1.40)
HT + Dep, n=110	25 (23)	1.30 (0.92 to 1.84)	1.35 (0.95 to 1.90)
HT + Cancer, n=84	6 (7)	0.41 (0.19 to 0.89)	0.50 (0.23 to 1.06)
HT + HD + DM, n=62	11 (18)	1.02 (0.59 to 1.74)	1.25 (0.74 to 2.08)
Anemia, n=50	9 (18)	1.03 (0.57 to 1.87)	1.08 (0.60 to 1.94)
HT + Ren/Liv. n=45	5 (11)	0.64 (0.28 to 1.46)	0.68 (0.30 to 1.54)
Number of comorbidities			
1 comorbidity, n=6,266	1,035 (17)	0.95 (0.88 to 1.02)	1.02 (0.95 to 1.10)
2 comorbidities, n=2,373	383 (16)	0.92 (0.83 to 1.02)	1.03 (0.93 to 1.15)
3 comorbidities, n=701	101 (14)	0.82 (0.68 to 0.99)	0.93 (0.77 to 1.12)
≥4 comorbidities, n=226	53 (23)	1.34 (1.06 to 1.71)	1.48 (1.17 to 1.88)

n: Number, CI: Confidence interval. Comor: Comorbidities, HT: Hypertension, DM: Diabetes mellitus 1 and 2, Resp: Respiratory disease, HD: Heart disease, Neu: Neurologic disease, RA: Rheumatoid arthritis, Dep: Depression, Ren/Liv: Renal and/or liver disease. *Adjusted for age, sex, BMI, educational level, not born in Denmark, civil status, physical activity, problems in other joints, use of analgesics, and number of bodily pain areas.