

## Supplement

**Table S1.** Summary of data extracted from systematic reviews.

Reference (year)	Intervention and comparator	Outcome	Time (from initiation of intervention)	Sample size	Significance	ES (95% CI)
<b>Education / action plans</b>						
Effing (2007) <sup>24</sup>	Self-management education and usual care	Hospital admissions:				
		COPD-related hospital admissions vs. regular care	-	7 RCTs	++	OR 0.64 (0.47 to 0.89); p=0.007
		HRQoL:				
		SG-RQ total vs. usual care	-	7 RCTs	+	WMD-2.58 (-5.14 to -0.02); p=0.05
		SG-RQ impact vs. usual care	-	7 RCTs	+	WMD-2.83 (-5.65 to -0.02)
Tan (2012) <sup>25</sup>	Disease-specific education and usual care	Hospital admissions:				
		COPD-related admissions vs. usual care	12 months	4 RCTs	+++	OR=0.55 (0.43 to 0.71); p<0.00001
		HRQoL:				
		SG-RQ impact vs. usual care	12 months	6 RCTs	+	WMD-3.78 (-6.82 to -0.73); p=0.02
		SG-RQ total and other domains vs. usual care	3 and 6 months	6 RCTs	0	NR
Turnock (2005) <sup>13</sup>	Action plans and usual care	Hospital admissions:				
		Hospital admissions vs. usual care	12 months	2 RCTs	0	WMD 0.16 (-0.09 to 0.42)
		HRQoL:				

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Walters (2010) <sup>23</sup>	Action plans with limited patient education only for exacerbations of COPD	SG-RQ overall vs. usual care	6 months	2 RCTs	0	WMD-1.91 (-5.46 to 1.63)
		SG-RQ symptoms vs. usual care	6 months	2 RCTs	0	WMD-4.78 (-10.81 to 1.24)
		SG-RQ activity vs. usual care	6 months	2 RCTs	0	WMD-2.43 (-7.37 to 2.50)
		SG-RQ impact vs. usual care	6 months	2 RCTs	0	WMD-0.62 (-4.45 to 3.21)
		SG-RQ overall vs. usual care	12 months	2 RCTs	0	WMD-0.32 (-3.34 to 2.70)
		SG-RQ symptoms vs. usual care	12 months	2 RCTs	0	WMD 1.87 (-3.27 to 7.00)
		SG-RQ activity vs. usual care	12 months	2 RCTs	0	WMD-2.82 (-6.84 to 1.19)
		SG-RQ impact vs. usual care	12 months	2 RCTs	0	WMD 1.16 (-2.21 to 4.53)
		Hospital admission	12 months	2 RCTs; 205 participants	0	MD 0.23 (-0.03 to 0.49)
		ED visits	12 months	2 RCTs; 201 participants	0	MD 0.37 (-0.50 to 1.24); I <sup>2</sup> =81%
		GP visits	12 months	3 RCTs; 256 participants	0	MD 0.53 (-0.45 to 1.50)
		Use of medications (number of courses of oral corticosteroids)	12 months	2 RCTs; 200 participants	+	MD 0.74 (0.12 to 1.35); I <sup>2</sup> =0%
		Use of medications (treated with at least one course of antibiotics for an acute exacerbation)	6-12 months	3 RCTs; 349 participants	++	OR 2.02 (1.29 to 3.17)
HRQoL - SGRQ	6 and 12 months	4 RCTs; 412 participants	0	MD 0.54 (-1.98 to 3.05) ; I <sup>2</sup> =3.1% (NS at 6 months or 12 months alone)		
<b>Complex interventions with a SMS focus</b>						
Dickens (2013) <sup>15</sup>	Complex interventions that reduce urgent care use in COPD	Use of urgent healthcare	1-24 months	32 RCTs; 3,941 participants	+++	The odds of urgent healthcare use were 32% lower in the intervention group; OR 0.68 (0.57 to 0.80). I <sup>2</sup> =37.4%
Kruis	Integrated disease	QoL:				

Reference (year)	Intervention and comparator	Outcome	Time (from initiation of intervention)	Sample size	Significance	ES (95% CI)
(2013) <sup>26</sup>	management interventions and controls (varying from usual care or no treatment to single interventions, mono-disciplinary interventions)	SGRQ – Short term	3-12 months	13 studies; 1425 participants	+++ (p<0.001)	MD -3.71 in favour of IDM (-5.83 to -1.59); I <sup>2</sup> = 56%
		SGRQ – Long term	18, 24 months	2 studies; 189 participants	0	MD -0.22 (-7.43 to 6.99); I <sup>2</sup> = 54%
		Exercise capacity: 6MWD – Short term	12 months	14 studies; 871 participants	+++	Improved 6MWD by a statistically and clinically relevant 43.86 meters (21.83 to 65.89); I <sup>2</sup> = 83%.  Restriction to studies with adequate allocation concealment reduced effect estimate to 15.15 meters, still statistically significant (95% CI 6.37 to 23.93, P < 0.001), but no longer clinically relevant.
		6MWD – Long term	24 months	2 studies; 184 participants	++	Improved 6MWD by 16.8 meters (MD 16.84; 3.01 to 30.67), I <sup>2</sup> = 0%
		Maximal exercise capacity (Watts) using the cycle ergometer test		4 studies; 298 participants	+++	IDM statistically significantly improved the maximal exercise capacity by 7 Watts (MD 6.99; 2.96 to 11.02, P < 0.0001)
		Exacerbations: Number of patients experiencing at least one exacerbation - short-term	12 months	2 studies; 407 participants	0	OR 1.21 (0.77 to 1.91); homogenous. P=0.42; No statistically or clinically relevant difference between groups
		Number of patients experiencing at least one exacerbation - long-term	24 months	2 studies; 301 participants	0	OR 1.53 (0.90 to 2.60) P = 0.12; homogenous.

Reference (year)	Intervention and comparator	Outcome	Time (from initiation of intervention)	Sample size	Significance	ES (95% CI)
		Hospital admissions, all causes - short-term	12 months	2 studies; 226 participants	0	OR 0.62 (0.36 to 1.07) P = 0.49. I <sup>2</sup> = 0%
		Hospital admissions, all causes - long-term	24 months	2 studies; 283 participants	0	OR 0.78 (0.38 to 1.57) P=0.50; I <sup>2</sup> = 53%
		Respiratory-related admissions - short-term	12 months	7 studies; 1153 participants	+	OR 0.68 (0.47 to 0.99) P = 0.04; homogenous
		Respiratory-related admissions - long-term	24 months	1 study; 179 participants	0	OR 0.59 (0.28 to 1.22) P = 0.16
		Hospital days per patient - short-term	12 months	6 studies; 741 participants	++	Patients treated with IDM on average discharged nearly 4 days earlier compared to control, CI 6 to 2 days (MD -3.78; -5.90 to -1.67, P < 0.001); I <sup>2</sup> = 55%.
		Hospital days per patient - long-term	24 months	1 study; 175 participants	0	MD 0.60 (-3.01 to 4.21) P = 0.74
		Emergency Department (ED) visits - short-term	12 months	4 studies; 1161 participants	0	OR 0.64 (0.33 to 1.25) I <sup>2</sup> = 71%
		Dyspnoea - MRC Dyspnoea Scale		3 studies; 345 participants	+++	Dyspnoea improved in IDM group by -0.30 points (MD -0.30; -0.48 to -0.11, I <sup>2</sup> = 0%, P < 0.001)
		Dyspnoea – Borg score		3 studies; 145 participants	0	MD 0.14 (-0.70 to 0.98) P = 0.74, I <sup>2</sup> = 39%
		Mortality	12 months (4)	4 studies; 1,113 participants	0	Short-term (OR 0.96; 0.52 to 1.74, P = 0.33; I <sup>2</sup> = 59%).
			24 months (1)	1 study; 122 participants		Long-term (OR 0.45; 0.16 to 1.28, P = 0.13)

Reference (year)	Intervention and comparator	Outcome	Time (from initiation of intervention)	Sample size	Significance	ES (95% CI)
Zwerink (2014) <sup>19</sup>	Self management for patients with COPD	Lung function:				
		Anxiety and depression - HADS		2 studies; 316 participants	0	Anxiety (MD 0.22; -0.41 to 0.85, I <sup>2</sup> = 0%), depression (MD 0.21, -0.39 to 0.81, I <sup>2</sup> = 0%)
		Anxiety and depression - MACL		1 study (55 participants)	0	-
		Hospitalisations:				
		Respiratory-related hospitalisations vs. usual care or active intervention	2-24 months	10 studies; 1749 participants	+++	OR 0.57 (0.43 to 0.75); P<0.001
		All cause hospitalisations vs. usual care or active intervention	2-24 months	7 studies, 1365 participants	+	OR 0.60 (0.40 to 0.89); P=0.011
		HRQoL:				
		SGRQ intervention vs. usual care or active intervention	2-24 months	10 RCTs; 1413 participants	+++	MD -3.51 (-5.37 to -1.65); P<0.001
		Mortality:				
			2-24 months	9 studies; 2134 participants	0	OR 0.79 (0.58 to 1.07); P=0.13
	Dyspnoea:					
	Medical Research Council Scale ((m)MRC) intervention vs. usual care or active intervention	2-24 months	3 studies; 119 participants	++	MD -0.83 (-1.36 to -0.30); P=0.002	
	Exercise capacity:					
	6MWD vs. usual care or active intervention	2-24 months	6 studies; 570 participants	0	MD 33.69 m (-9.12 to 76.50); P=0.12	
Jordan	Supported self-	Quality of life: SRGQ	2-12 month	6 RCTs; 845 participants	0	MD -3.84 (-6.40 to -1.29) P=0.321

Reference (year)	Intervention and comparator	Outcome	Time (from initiation of intervention)	Sample size	Significance	ES (95% CI)
(2015) <sup>18</sup>	management for patients with moderate to severe COPD	Emergency department visits	2-6 months	5 RCTs; 932 participants	NR	Not combined
Hospitalisations		12 months	7 RCTs; 1,217 participants	++	HR 0.78 (0.52 to 1.17); P = 0.002	
Mortality		2-12 months	6 RCTs; 1,179 participants	0	HR 1.07 (0.74 to 1.54); P=0.714	
<b>Pulmonary rehabilitation</b>						
McCarthy (2015) <sup>14</sup>	Pulmonary rehabilitation for COPD	HRQoL: CRQ - Fatigue:		19 RCTs; 1291 participants	+++	MD 0.68 (0.45 to 0.92); P<0.001; Tau <sup>2</sup> = 0.15; I <sup>2</sup> = 64%
HRQoL: CRQ - Emotional function:			19 RCTs; 1291 participants	+++	MD 0.56 (0.34 to 0.78); P<0.001; Tau <sup>2</sup> = 0.12; I <sup>2</sup> = 58%	
HRQoL: CRQ - Mastery:			19 RCTs; 1212 participants	+++	MD 0.71 (0.47 to 0.95); P<0.001; Tau <sup>2</sup> = 0.16; I <sup>2</sup> = 63%;	
HRQoL: CRQ - Dyspnoea:			19 RCTs; 1283 participants	+++	MD 0.79 (0.56 to 1.03); 19 trials; 1283 participants; P<0.001; Tau <sup>2</sup> = 0.15; I <sup>2</sup> = 63%;	
HRQoL: SGRQ total			19 trials; 1146 participants;	+++	MD -6.89 (-9.26 to -4.52); P<0.001; Tau <sup>2</sup> = 13.17; I <sup>2</sup> = 59%;	
HRQoL: SGRQ symptoms			19 trials; 1153 participants;	+++	MD -5.09 (-7.69 to -2.49); P<0.001; Tau <sup>2</sup> = 7.79; I <sup>2</sup> = 26%;	
HRQoL: SGRQ impact			19 trials; 1149 participants;	+++	MD -7.23 (-9.91 to -4.55); P<0.001; Tau <sup>2</sup> = 17.94; I <sup>2</sup> = 58%;	
HRQoL: SGRQ activity			19 trials; 1148 participants;	+++	MD -6.08 (-9.28 to -2.88); P<0.001; Tau <sup>2</sup> = 27.01; I <sup>2</sup> = 64%;	
		Maximal exercise capacity		16 studies; 779	++	MD 6.77 (1.89 to 11.65); P=0.007; Tau <sup>2</sup>

Reference (year)	Intervention and comparator	Outcome	Time (from initiation of intervention)	Sample size	Significance	ES (95% CI)
				participants		= 40.97; I <sup>2</sup> = 74%;
		Functional exercise capacity – 6MWD		38 trials; 1879 participants; 1012 actively treated, 867 controls	+++	MD 43.93 m (32.64 to 55.21); P<0.001; Tau <sup>2</sup> = 713.49; I <sup>2</sup> = 74%;
		Functional exercise capacity – ISWT		8 trials; 694 participants	+++	MD 39.77 (22.38 to 57.15); P<0.001; Tau <sup>2</sup> = 181.56; I <sup>2</sup> = 32%
<b>Telehealth</b>						
Cruz (2014) <sup>21</sup>	Home telemonitoring effectiveness in COPD	Health care utilisation:				
		Hospitalisation rates		6 RCTs, 2 NRCTs; 486 participants	+	RR 0.72 (0.53 to 0.98); Z=2.12; p=0.034; I <sup>2</sup> =4.73%
		Mean number of hospitalisations		3 RCTs, 1 NRCT; 244 participants	0	SMD -0.06 (-0.32 to 0.19); Z=0.50; p=0.617; I <sup>2</sup> =16.42%
		Length of hospital stay		3 RCTs, 1 NRCT; 244 participants	0	SMD 0.06 (-0.19 to 0.31); Z=0.48; p=0.635; I <sup>2</sup> =0%
		ED visit rates		4 RCTs; 194 participants	0	RR 0.68 (0.38 to 1.18); Z=1.34; p=0.179; I <sup>2</sup> =22.53%
		Mean number of ED visits	4-6 months	1 RCT, 1NRCT; 160 participants	0	SMD 0.20 (-0.49 to 0.88); Z=0.56; p=0.576). I <sup>2</sup> =74.81%
		Health outcomes:				
		Mortality rates		3 RCTs, 1 NRCT; 294 participants	0	RR 1.43 (0.40 to 5.03); Z=0.55; p=0.582; I <sup>2</sup> =0%
		Mean change (i.e., posttest–pretest) of total and sub-dimension scores of the SGRQ		2 RCTs ;	+	SMD 0.53 (-0.97 to -0.09); Z=2.35; p=0.019; I <sup>2</sup> =17.74%
Kamei	Telehome monitoring-	Health care utilisation				



Reference (year)	Intervention and comparator	Outcome	Time (from initiation of intervention)	Sample size	Significance	ES (95% CI)
(2012) <sup>20</sup>	based telenursing for patients with COPD (included patients with mainly severe COPD)	Hospitalisation in patients with severe and very severe COPD	3-12 months	4 RCTs, 2 NRCT; 450 participants	++	RR 0.81 (0.69 to 0.95); I <sup>2</sup> =0%
		Hospitalisation in patients with moderate COPD	3-12 months	4 RCTs, 2 NRCT; 100 participants	0	RR 0.55 (0.22 to 1.36); I <sup>2</sup> not reported.
		Hospitalisation in all COPD patients	3-12 months	4 RCTs, 2 NRCT; 550 participants	+	RR 0.80 (0.68 to 0.94); I <sup>2</sup> =0%
		Comparison of hospitalisation by THMTN duration for patients receiving THMTN for ≤3, 6 and 12months compared to CT/C	≤3 months	137 patients	0	RR 0.64 (0.31 to 1.33);
			6 months	155 patients		RR 0.78 (0.50 to 1.20);
			12 months	258 patients		RR 0.80 (0.64 to 1.01);
		Number of emergency department visits	3-12 months	4 RCTs; 335 participants	+++	RR 0.52 (0.41 to 0.65); I <sup>2</sup> =0%
		Disease exacerbations in severe and very severe COPD patients 3 months after THMTN	3-12 months	2 RCTs; 138 participants	+++	RR 0.57 (0.41 to 0.79); I <sup>2</sup> =0%
		Mean number of hospitalisations in severe COPD patients	6-12 months	5 RCTs; 453 participants	++	MD -0.14 (-0.19 to -0.09); P<0.001; I <sup>2</sup> =0%
Mean duration of bed days of care in moderate to very severe COPD patients	1-6 months	2 RCTs; 215 participants	++	MD -0.76 (-0.79 to -0.73) P<0.001		
Mortality in moderate to very severe COPD patients	1-12 months	5 RCT; 374 patients	0	RR 1.36 (0.77 to 2.41); P=0.29; I <sup>2</sup> =0%		
Lundell (2014) <sup>28</sup>	Telehealthcare for COPD (making pulmonary rehab more accessible)	Physical activity	12 months	1 RCT; 125 participants	+++	SMD -0.081 (-0.918 to 0.755)
		Physical capacity - 6MWD		6 RCTs; 533 participants	0	MD -1.3 m (-8.1 to 5.5)
		Dyspnoea :		7 RCTs; 826	0	SMD 0.088 (0.056 to 0.233); P=0.232
		Chronic Respiratory				

Reference (year)	Intervention and comparator	Outcome	Time (from initiation of intervention)	Sample size	Significance	ES (95% CI)
		Questionnaire, Dyspnoea subscale (CRQ-D), Medical Research Council (MRC) Dyspnoea scale, and Shortness of Breath Questionnaire (SOBQ)				
McLean (2011) <sup>27</sup>	Telehealthcare for COPD	Quality of life: SRGQ		2 RCTs; 253 participants)	0	MD -6.57 (-13.62 to 0.48), P=0.07 minimally clinically significant change although the CIs are very wide
		Emergency department visits	12 months	3 RCTs; 449 participants	++	OR 0.27 (0.11 to 0.66) P=0.005
		Hospitalisations	12 months	4 RCTs; 604 participants	+++	OR 0.46 (0.33 to 0.65); P < 0.00001
		Deaths	12 month	3 RCTs; 503 participants	0	OR 1.05 (0.63 to 1.75); P=0.86
<b>Outreach nursing programme</b>						
Wong (2012) <sup>29</sup>	Home care by outreach nursing vs. usual care, without respiratory nurse/health worker input	Hospital admissions: Hospitalisations vs. routine care	–	5 RCTs	0	Peto OR 1.01 (0.71 to 1.44); p=0.95
		HRQoL: SG-RQ total vs. routine care	–	4 RCTs	+	MD -2.60 (-4.81 to -0.39); p=0.02
		SG-RQ activity vs. routine care	–	3 RCTs	0	NR
		SG-RQ impact vs. routine care	–	3 RCTs	0	NR
		SG-RQ symptoms vs. routine care	–	3 RCTs	0	NR

Abbreviation: NR: Not reported; SMS: Short Messaging Service; SGRQ: St. George's Respiratory Questionnaire; 6MWD: 6 minute walking distance; MACL: Mood Adjective Check List; CT/C: Conventional treatment/care; ISWT: Incremental shuttle walk test.