

Table 1: Summary of study, population, intervention and comparator characteristics

Study characteristics	Number of studies (%) or median of study means (range)
Publication year	
1970-1979	2 (2%)
1980-1989	12 (14%)
1990-1999	20 (24%)
2000-2009	21 (25%)
2010-2019	23 (27%)
2020 onwards	7 (8%)
Study continent	
Europe	48 (56%)
North America	13 (15%)
Asia	16 (19%)
Australia	5 (6%)
Other	3 (4%)
LMIC	21 (25%)
Single centre	61 (72%)
Sample size	137 (25 – 3959)
Duration of follow-up, months	12 (6 – 228)
Population Characteristics	
Sex	
Males only	21 (25%)

Females only	1 (1%)
Both males and females	61 (72%)
Not reported	2 (2%)
Age, years	56 (44-77)
Diagnosis	
Post-MI only	40 (47%)
Revascularisation only	14 (16%)
Angina only	5 (6%)
Mixed CHD population	25 (29%)
Other ^a	1 (1%)
Intervention characteristics	
Intervention type	
Exercise only programme	38 (45%)
Comprehensive programme	47 (56%)
Dose of intervention	
Duration	6 months (0.75 – 42)
Frequency	1-7 sessions/week
Length	20 to 90 minutes/session
Intensity	<ul style="list-style-type: none"> • 50%-90% maximal/peak HR or HRR • 50-95% VO₂ max • Borg RPE 11-16
Setting	
Centre-based only	40 (47%)

Combination of centre and home	21 (25%)
Home-based only	21 (25%)
Not reported	3 (3%)
Comparator	
Usual/Standard care	50 (59%)
Usual care plus ^b	24 (28%)
“No exercise”	8 (9%)
Other	3 (4%)

^aHe 2020 recruited patients with MI in the absence of obstructive coronary artery disease (MINOCA). ^bUsual care plus education, guidance or advice about diet and exercise, but no formal exercise training.

HR, heart rate; HRR, heart rate reserve; RPE, ratings of perceived exertion; VO₂max, maximal oxygen uptake; LMIC: low-middle income country; CHD: coronary heart disease

Table 2: Summary of meta-analysis effects of exercise-based CR on clinical event outcomes at longest follow-up, short-term follow-up (6-12 months), medium-term follow-up (13-36 months), and long-term follow-up (>36 months)

Outcome Follow-up time point	N participants	N studies	N Events/Participants		RR (95%CI)	Statistical Heterogeneity I ² Statistic Chi-Square Test	GRADE assessment of certainty
			Intervention	Comparator			
Overall mortality							
Longest follow-up	16,829	47	919/8608	950/8221	0.96 (0.89 to 1.04)	0%	
6-12 months	8823	25	228/4590	242/4233	0.87 (0.73 to 1.04)	35%	⊕⊕⊕⊖ MODERATE ¹
13-36 months	11,073	16	467/5611	498/5462	0.90 (0.80 to 1.02)	0%	
> 36 months	3828	11	476/1902	493/1926	0.91 (0.75 to 1.10)	35%	
CV mortality							
Longest follow up	7762	26	296/3997	382/3765	0.74 (0.64 to 0.86) ^{***}	0%	

6-12 months	5360	15	109/2799	114/2561	0.88 (0.68 to 1.14)	0%	⊕⊕⊕⊖ MODERATE ¹
13-36 months	3614	5	199/1861	39/1753	0.77 (0.63 to 0.93)**	5%	
> 36 months	1392	8	56/690	100/702	0.58 (0.43 to 0.78)***	0%	
Fatal and/or non-fatal MI							
Longest follow up	14,151	39	383/7181	437/6970	0.82 (0.70 to 0.96)*	9%	
6-12 months	7423	22	140/3820	174/3603	0.72 (0.55 to 0.93)*	7%	⊕⊕⊕⊖ MODERATE ²
13-36 months	9565	12	264/4830	237/4735	1.07 (0.91 to 1.27)	0%	
> 36 months	1560	10	65/776	102/784	0.67 (0.50 to 0.90)**	0%	
CABG							
Longest follow up	5872	29	211/3028	215/2844	0.96 (0.80 to 1.15)	0%	
6-12 months	4473	20	125/2324	232/2149	0.99 (0.78 to 1.27)	0%	⊕⊕⊕⊕ HIGH
13-36 months	2826	9	123/1413	126/1413	0.97 (0.77 to 1.23)	0%	

> 36 months	675	4	19/333	29/342	0.66 (0.34 to 1.27)	18%	
PCI							
Longest follow up	3878	17	171/1960	201/1918	0.84 (0.69 to 1.02)	0%	
6-12 months	3465	13	91/1743	104/1722	0.86 (0.63 to 1.19)	7%	⊕⊕⊕⊖ MODERATE ¹
13-36 months	1983	6	114/996	116/987	0.96 (0.69 to 1.35)	26%	
> 36 months	567	3	28/281	37/286	0.76 (0.48 to 1.20)	0%	
All-cause hospitalisation							
Longest follow up	7802	21	504/3958	593/3844	0.77 (0.67 to 0.89)**	32%	
6-12 months	2030	14	130/1054	209/976	0.58 (0.43 to 0.77)***	42%*	⊕⊕⊕⊖ MODERATE ²
13-36 months	5995	9	392/3017	417/2978	0.92 (0.82 to 1.03)	0%	
CV hospitalisation							
Longest follow up	1730	8	152/871	174/859	0.85 (0.67 to 1.08)	12%	
6-12 months	1087	6	40/546	42/541	0.8 (0.41 to 1.59)	53%	⊕⊕⊖⊖ LOW ^{1 3}

13-36 months	943	3	129/470	141/473	0.92 (0.76 to 1.12)	0%	
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¹ downgraded by one level due to imprecision with a wide confidence interval

² downgraded by one level due to evidence of publication bias

³ downgraded by one level due to substantial heterogeneity

*p<0.05; **p<0.01; ***p<0.001

CR: cardiac rehabilitation; RR: risk ratio; CI: confidence interval; CV: cardiovascular; MI: myocardial infarction; CABG: coronary artery

bypass graft; PCI: percutaneous coronary intervention

Table 3: Summary of costs of exercise-based rehabilitation and usual care

Author/ year	Briffa 2005	Hambrecht 2004	Hautala 2017	Kovoor 2006/ Hall 2002	Maddison 2014	Marchionni 2003	Oldridge 1991/93	Yu 2004
Follow-up (months)	12	12	12	12	6	14	12	24
Year of costs (currency)	1998 (\$Aus)	NR	NR (€; Euros)	1999 (\$AUD)	NR (€; Euros)	2000 (\$USD)	1991 (\$USD)	2003 (\$USD)
Cost of rehabilitation								
Mean cost/patient	\$694	NR	€299	\$394	€127	\$5246	\$670	NR
Costs considered	Details of costed elements not provided	NR	Estimated according to the average	staff, assessments, counseling,	NR	NR	space, equipment, staff,	NR

monthly fees education, literature
in Finnish patient travel resources,
gyms where operating
individual costs,
guidance in parking,
exercise patients costs
training is led
by a health
care
professional

Total healthcare costs

Rehabilitation

mean	\$4937	\$3708 ± 156	€1944	NR	NR	\$17 272	NR	\$15 292
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cost/patient

Usual care								
mean	\$4541	\$6086 ± 370	€3027	NR	NR	\$12 433	NR	\$15 707
cost/patient								
Absolute								
difference in mean	\$395	-\$2378	-€1083	NR	NR	\$4839	\$480	-\$415
cost/patient*								
P value for								
cost difference	0.74	P < 0.001	NR	P > 0.05 (see below)		NR	NR	NR
								P > 0.05
Additional healthcare costs considered	hospitalisations, pharmaceuticals, tests, consultations,	rehospitalisations, revascularisation, cycle ergometers, training facilities,	Primary health care costs, secondary	phone calls (p=0.10); hospital admissions	NR	NR	Service utilisation, physician costs,	hospitalisations; revascularisations; private clinic visit; cardiac clinic

rehabilitation,	and supervising	health care	(p=0.11);	emergency	visits; public
patient expenses,	staff	costs,	gated heart	costs, in-	noncardiac visits;
ambulance		occupational	pool scan	patient days,	casualty visits;
		health care	(p=0.50);	allied health,	drugs
		service costs	exercise stress	other	
			test (p=0.72);	rehabilitation	
			other	visits	
			diagnostics		
			(p=0.37);		
			visits to		
			general		
			practitioner		
			(p=0.61),		
			specialist		
			doctor		
			(p=0.35), or		

health-care
 professional
 (p=0.31)

Cost-effectiveness

Utility-Based			Average					
Rehabilitation mean health care benefits	Quality of life– Heart questionnaire: 0.026 (95% CI, 0.013 to 0.039)	NR	change in 15D utility: 0.013	NR	NR	NR	NR	NR
Usual care mean health care benefit	Utility 0.010 (95% CI, –0.001 to 0.022)	NR	Average change in 15D utility: - 0.012	NR	NR	NR	NR	NR

Incremental mean health care benefit	Utility 0.013 (95% CI, NR), P = 0.38; NR +0.009 QALYS	0.045 QALYs (0.023-0.077)	NR	NR	NR	0.052 QALYS (95% CI, 0.007 to 0.1)
Incremental cost effectiveness ratio/patient	+\$42,535 per QALY. Extensive sensitivity analyses reported.	-€24,511 /QALYs	NR	+€15,247 per QALY	NR	+\$9,200 per QALY -\$650 per QALY

NR: not reported; QALY: quality-adjusted life year.