

Contemporary Trends in Cardiac Rehabilitation Post-Myocardial Infarction: A Systematic Review

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Background

- Known benefits of exercise-based cardiac rehabilitation (CR) post myocardial infarction (MI) include reduced rate of re-infarction, increased lifespan, and decreased healthcare utilization¹.
- Other CR benefits include reduced fear-avoidance behaviors², improved participation in exercise after a cardiac event³, and improved quality of life (QOL).
- Exercise mode and specific parameters (frequency, intensity, duration, longevity) that optimize outcomes are ill-defined.

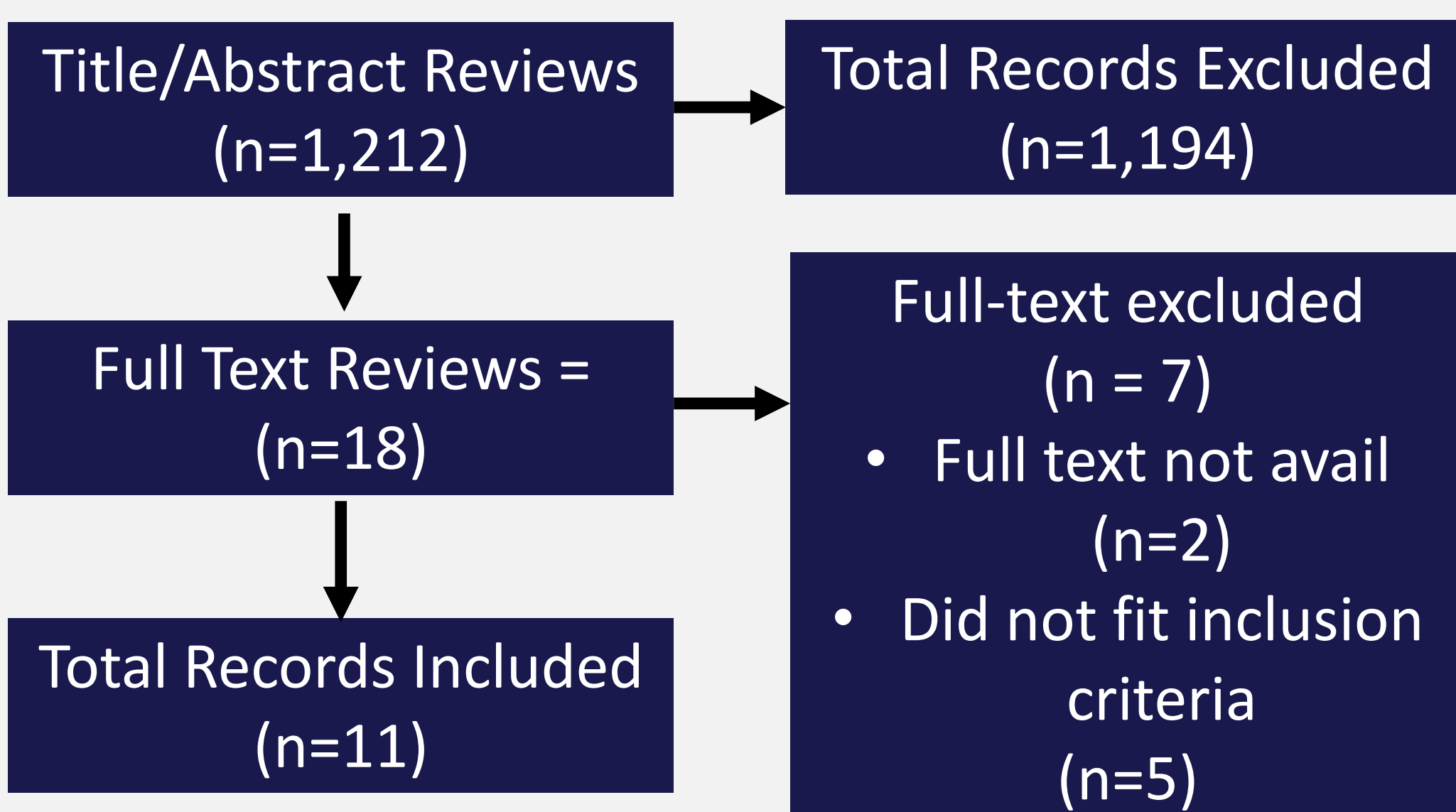


Objectives

1. Analyze CR protocols and outcomes in contemporary randomized controlled trials.
2. Identify research gaps and inconsistencies.
3. Suggest future research directions.

Methods

- Databases searched: PubMed, Embase, and Web of Science, 2011-2017



Exercise Protocol Parameters

Study	Mode	Intensity (%HR peak)	Intensity (%VO ₂ peak)	Program Longevity (mos)	Session Duration (min)	Frequency (per wk)
Aamot 2014	TM, CE, Pt choice	85 - 95	-	3	45 - 47	2
Basati 2012	NS	60 - 85	-	2	60 - 90	3
Fontes-Carvalho 2015	TM, CE, Resistance	70 - 85	-	2	70	3
Giallauria 2012	CE, Education	-	60 - 70	6	40	3
Giallauria 2011	CE, Education	-	60 - 70	6	40	3
Golabchi 2012	Aerobic NS, Education	60 - 85	-	2	30 - 60	3
Moholdt 2012	TM	85 - 95	-	3	Tx: 38; C: 60	3
Oliveira 2015	TM, CE	70 - 85	-	2	40	3
Oliveira 2014	TM, CE	70 - 85	-	2	50	3
Ortega 2014	CE	< 85	-	6 - 7	35	3 - 5
Vahedian-Asimi 2016	FCEM	Pt choice	-	NS	120	N/A

C: Control, CE: Cycle Ergometer, FCEM: Family Centered Empowerment Model, HR: Heart Rate, NS: Not stated, Pt: participant, TM: Treadmill, Tx: Treatment group, VO₂Peak: Peak volitional oxygen uptake in ml/kg/min, Wk: week

Quality Assessment

Cochrane Risk of Bias Assessment								
Study	Random Sequence	Allocation Concealment	Selective Reporting	Other Bias	Blinding: Pt/Personnel	Blinding: Outcomes	Incomplete Outcomes	Quality Rating
Aamot 2014	✓	?	✓	✓	+	+	✓	Poor
Basati 2012	?	?	✓	✓	+	+	✓	Poor
Fontes-Carvalho 2015	✓	?	?	✓	+	✓	✓	Poor
Giallauria 2012	✓	?	?	?	+	✓	✓	Poor
Giallauria 2011	?	?	✓	✓	+	✓	✓	Poor
Golabchi 2012	?	?	?	+	?	?	?	Poor
Moholdt 2012	✓	✓	✓	✓	+	+	✓	Poor
Oliveira 2015	✓	?	+	✓	+	✓	✓	Poor
Oliveira 2014	✓	?	✓	✓	+	✓	✓	Poor
Ortega 2014	✓	?	✓	✓	+	✓	✓	Poor
Vahedian-Asimi 2016	✓	✓	✓	✓	✓	?	✓	Fair

+ = high risk ✓ = low risk ? = unclear

Results

Demographics (Total N = 902):

- Mean age = 56.3 years
- Male = 84%
- Race/Ethnicity = Not reported

Exercise Mode and Parameters:

- Mode: Treadmill or Cycle Ergometer
- Parameters:
 - Intensity = ≥ 60% HR or VO₂ peak
 - Frequency = 3x/wk
 - Duration = ≥ 35 min
- Program Longevity = ≥ 2 mos

Program Outcomes:

- VO₂/Cardiac Function – improved, no specific mode or parameter optimal.
- QOL – No difference control vs exercise.
- Novel family model improved cardiac function and exercise tolerance.

Conclusions

- Despite protocol variations, exercise capacity and cardiac function showed improvements. However, overall study quality generally poor.
- No optimal mode or parameters identified.
- Previously identified research gaps (i.e., gender and racial/ethnic disparities) have not been addressed.
- CR models that include social support may impact patient outcomes.

Clinical Relevance

- Future research must be rigorous and target disparities and protocol optimization.
- Non-exercise related factors (social health determinants) require exploration.

Acknowledgements/References

Leila Ledbetter, MLIS, with database search.
 References available upon request.

Image: <https://www.drpaulluk.com/blog/electromagnetic-fields-and-the-heart/>