Title of metaanalysis :

# **Effects of exercise based cardiac rehabilitation delivery modes on chronic heart failure: a systematic review and network meta-analysis**

PubMed ID of metaanalysis: 39732888

**Search terms**:

# 1 ((((((((((((((Heart failure[MeSH Terms]) OR (Cardiac Failure[Title/Abstract])) OR (Heart

Decompensation[Title/Abstract])) OR (Decompensation, Heart[Title/Abstract])) OR (Heart Failure, Right

-Sided[Title/Abstract])) OR (Heart Failure, Right Sided[Title/Abstract])) OR (Right-Sided Heart

Failure[Title/Abstract])) OR (Right Sided Heart Failure[Title/Abstract])) OR (Myocardial

Failure[Title/Abstract])) OR (Congestive Heart Failure[Title/Abstract])) OR (Heart Failure,

Congestive[Title/Abstract])) OR (Heart Failure, Left-Sided[Title/Abstract])) OR (Heart Failure, Left

Sided[Title/Abstract])) OR (Left-Sided Heart Failure[Title/Abstract])) OR (Left Sided Heart

Failure[Title/Abstract])

# 2 (((((((Cardiac Rehabilitation[MeSH Terms]) OR (Cardiac Rehabilitations[Title/Abstract])) OR

(Rehabilitation, Cardiac[Title/Abstract])) OR (Rehabilitations, Cardiac[Title/Abstract])) OR

(Cardiovascular Rehabilitation[Title/Abstract])) OR (Cardiovascular

Rehabilitations[Title/Abstract])) OR (Rehabilitation, Cardiovascular[Title/Abstract])) OR

(Rehabilitations, Cardiovascular[Title/Abstract])

# 3 (((((((((((((((((((((((((exercise[MeSH Terms]) OR (Exercises[Title/Abstract])) OR (Physical

Activity[Title/Abstract])) OR (Activities, Physical[Title/Abstract])) OR (Activity,

Physical[Title/Abstract])) OR (Physical Activities[Title/Abstract])) OR (Exercise,

Physical[Title/Abstract])) OR (Exercises, Physical[Title/Abstract])) OR (Physical

Exercise[Title/Abstract])) OR (Physical Exercises[Title/Abstract])) OR (Acute

Exercise[Title/Abstract])) OR (Acute Exercises[Title/Abstract])) OR (Exercise,

Acute[Title/Abstract])) OR (Exercises, Acute[Title/Abstract])) OR (Exercise,

Isometric[Title/Abstract])) OR (Exercises, Isometric[Title/Abstract])) OR (Isometric

Exercises[Title/Abstract])) OR (Isometric Exercise[Title/Abstract])) OR (Exercise,

Aerobic[Title/Abstract])) OR (Aerobic Exercise[Title/Abstract])) OR (Aerobic

Exercises[Title/Abstract])) OR (Exercises, Aerobic[Title/Abstract])) OR (Exercise

Training[Title/Abstract])) OR (Exercise Trainings[Title/Abstract])) OR (Training,

Exercise[Title/Abstract])) OR (Trainings, Exercise[Title/Abstract])

# 4 #1 AND #2 AND #3

**Inclusion Criteria:**

The study encompasses randomized controlled trials (RCTs) on exercise-based CR that were published in English. These trials, irrespective of blinding or allocation concealment, included complete patient information. The inclusion criteria focused on interventions strictly following established CR delivery models, excluding control groups with additional exercise interventions beyond standard care.

**Exclusion Criteria:**

Our study excludes non-RCTs such as conference abstracts, reviews (including systematic reviews), editorials, observational studies, animal studies, and pediatric trials. Studies deviating from the principles of randomization or lacking robust experimental design and those comparing the effectiveness of CR across different training periods are also excluded. Finally, studies with outcome measures inappropriate for this NMA are omitted. Studies with incomplete outcome data were excluded to improve the reliability of our findings.

Search Date: August 2024

Included studies: 33 RCTs

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| Study title | Pubmed ID of included study |
| Corvera-Tindel, T., Doering, L. V., Woo, M. A., Khan, S. & Dracup, K. Effects of a home walking exercise program on functional status and symptoms in heart failure. Am. Heart J. 147(2), 339–346 (2004). | * **14760334** |
| Peng, X. et al. Home-based telehealth exercise training program in Chinese patients with heart failure: A randomized controlled trial. Medicine (Baltimore). 97(35), e12069 (2018). | * **30170422** |
| Chien, C. L., Lee, C. M., Wu, Y. W. & Wu, Y. T. Home-based exercise improves the quality of life and physical function but not the psychological status of people with chronic heart failure: a randomised trial. J. Physiother. 57(3), 157–163 (2011). | * **21843830** |
| Oka, R. K. et al. Impact of a home-based walking and resistance training program on quality of life in patients with heart failure. Am. J. Cardiol. 85(3), 365–369 (2000). | * **11078308** |
| Piotrowicz, E. et al. Effects of a 9-week hybrid comprehensive telerehabilitation program on long-term outcomes in patients with heart failure: The telerehabilitation in heart failure patients (TELEREH-HF) randomized clinical trial. JAMA Cardiol. 5(3), 300–308 (2020). | * **31734701** |
| Dracup, K. et al. Effects of a home-based exercise program on clinical outcomes in heart failure. Am. Heart J. 154(5), 877–883 (2007). | * **17967593** |
| Piotrowicz, E. et al. A new model of home-based telemonitored cardiac rehabilitation in patients with heart failure: effectiveness, quality of life, and adherence. Eur. J. Heart Fail. 12(2), 164–171 (2010). | * **20042423** |
| O’Connor, C. M., Whellan, D. J., Lee, K. L., Keteyian, S. J., Cooper, L. S. & Ellis, S. J., et al.; HF-ACTION Investigators. Efficacy and safety of exercise training in patients with chronic heart failure: HF-ACTION randomized controlled trial. JAMA. 301(14), 1439–50 (2009). | * **19351941** |
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| Hwang, R., Bruning, J., Morris, N. R., Mandrusiak, A. & Russell, T. Home-based telerehabilitation is not inferior to a centre-based program in patients with chronic heart failure: a randomised trial. J. Physiother. 63(2), 101–107 (2017). | * **28336297** |
| Conraads, V. M. et al. Combined endurance/resistance training reduces NT-proBNP levels in patients with chronic heart failure. Eur. Heart J. 25(20), 1797–1805 (2004). | * **15474694** |
| Belardinelli, R., Georgiou, D., Cianci, G. & Purcaro, A. Randomized, controlled trial of long-term moderate exercise training in chronic heart failure: Effects on functional capacity, quality of life, and clinical outcome. Circulation. 99(9), 1173–1182 (1999). | * **10069785** |
| Hambrecht, R. et al. Physical training in patients with stable chronic heart failure: Effects on cardiorespiratory fitness and ultrastructural abnormalities of leg muscles. J. Am. Coll. Cardiol. 25(6), 1239–1249 (1995). | * **7722116** |
| Du, H. et al. The Home-Heart-Walk study, a self-administered walk test on perceived physical functioning, and self-care behaviour in people with stable chronic heart failure: A randomized controlled trial. Eur. J. Cardiovasc. Nurs. 17(3), 235–245 (2018). | * **28857618** |
| Chen, Y. W. et al. Home-based cardiac rehabilitation improves quality of life, aerobic capacity, and readmission rates in patients with chronic heart failure. Medicine (Baltimore). 97(4), e9629 (2018). | * **29369178** |
| Dalal, H. M. et al. The effects and costs of home-based rehabilitation for heart failure with reduced ejection fraction: The REACH-HF multicentre randomized controlled trial. Eur. J. Prev. Cardiol. 26(3), 262–272 (2019). | * **30304644** |
| Piotrowicz, E. et al. Home-based telemonitored Nordic walking training is well accepted, safe, effective and has high adherence among heart failure patients, including those with cardiovascular implantable electronic devices: A randomised controlled study. Eur. J. Prev. Cardiol. 22(11), 1368–1377 (2015). | * **25261268** |
| Austin, J., Williams, R., Ross, L., Moseley, L. & Hutchison, S. Randomised controlled trial of cardiac rehabilitation in elderly patients with heart failure. Eur. J. Heart Fail. 7(3), 411–417 (2005). | * **15718182** |
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| Modified high-intensity interval training increases peak cardiac power output in patients with heart failure | * **24880226** |
| Effect of home-based walking on performance and quality of life in patients with heart failure | **22686421** |
| Brubaker, P. H., Moore, J. B., Stewart, K. P., Wesley, D. J. & Kitzman, D. W. Endurance exercise training in older patients with heart failure: Results from a randomized, controlled, single-blind trial. J. Am. Geriatr. Soc. 57(11), 1982–1989 (2009). | * **20121952** |
| Nagatomi, Y. et al. Home-based cardiac rehabilitation using information and communication technology for heart failure patients with frailty. ESC Heart Fail. 9(4), 2407–2418. https://doi.org/10.1002/ehf2.13934 (2022). | * **35534907** |
| Lundgren, K. M. et al. Feasibility of telerehabilitation for heart failure patients inaccessible for outpatient rehabilitation. ESC Heart Fail. 10(4), 2406–2417 (2023). | * **37221704** |
| Kitzman, D. W. et al. Physical rehabilitation for older patients hospitalized for heart failure. N. Engl. J. Med. 385(3), 203–216. https://doi.org/10.1056/NEJMoa2026141 (2021). | * **33999544** |
| Yeh, G. Y. et al. Tai chi exercise in patients with chronic heart failure: A randomized clinical trial. Arch. Intern. Med. 171(8), 750–757. https://doi.org/10.1001/archinternmed.2011.150 (2011). | * **21518942** |
| Yeh, G. Y. et al. Effects of tai chi mind-body movement therapy on functional status and exercise capacity in patients with chronic heart failure: A randomized controlled trial. Am. J. Med. 117(8), 541–548. https://doi.org/10.1016/j.amjmed.2004.04.016 (2004). | * **15465501** |