Original Article Open Access

Effectiveness of a comprehensive home-based cardiac rehabilitation intervention on the health promotion of patients with coronary artery disease: A randomized double-blind clinical trial

Zahra Teimouri-Jervekani[1], Niloufar Ebadi[2], Marjan Jamalian[3], Fereshte Rastegarnasab[4], Safoura Yazdekhasti[1], Hamidreza Roohafza[2], Hassan Okati Aliabad[5], Alireza Ansari Moghaddam[5], Masoumeh Sadeghi[1*]

1- Cardiac Rehabilitation Research Center, Cardiovascular Research Institute, Isfahan University of Medical Sciences, Isfahan, Iran
2- Isfahan Cardiovascular Research Center, Cardiovascular Research Institute, Isfahan University of Medical Sciences, Isfahan, Iran
3- Chamran Cardiovascular Medical and Research Hospital, Isfahan University of Medical Sciences, Isfahan, Iran
4- Hypertension Research Center, Cardiovascular Research Institute, Isfahan University of Medical Sciences, Isfahan, Iran
5- Health Promotion Research Center, Zahedan University of Medical Sciences, Zahedan, Iran

Correspondence:

Masoumeh Sadeghi;
Cardiac Rehabilitation Research Center, Cardiovascular Research Institute, Isfahan University of Medical Sciences, Isfahan, Iran;
Email: sadeghimasoumeh@gmail.com

Received: 2025-10-27
Accepted: 2026-04-19

How to cite this article:
Teimouri-Jervekani Z, Ebadi N, Jamalian M, Rastegarnasab F, Yazdekhasti S, Roohafza H, Okati Aliabad H, Ansari Moghaddam A, Sadeghi M. **Effectiveness of a comprehensive home-based cardiac rehabilitation intervention on the health promotion of patients with coronary artery disease: A randomized double-blind clinical trial.** ARYA Atheroscler. 2026; 22(3): 67-74.

DOI:
https://doi.org/10.48305/arya.2026.45704.3108

Abstract

BACKGROUND: This study aimed to assess the efficacy of a comprehensive home-based cardiac rehabilitation (HBCR) program in promoting health outcomes among Iranian patients with coronary artery disease (CAD).

METHODS: This randomized, double-blind, clinical trial was conducted on 259 patients with CAD. Participants were allocated to receive either usual care or the HBCR program. Anthropometric indices, lipid profiles, and cardiovascular events were evaluated at baseline and during the follow-up periods.

RESULTS: Changes in serum low-density lipoprotein cholesterol (LDL-C) and arterial blood pressure did not differ significantly between the groups. Body mass index (BMI) was significantly reduced in the HBCR group compared to the control group (P = 0.004). At the study endpoint, hip circumference also demonstrated a more favorable status in the HBCR group (P = 0.002). High-density lipoprotein cholesterol (HDL-C) serum levels improved more prominently in the HBCR group (P = 0.030). Triglyceride (TG) levels showed a similar pattern in both groups, but the overall increase after 12 months was significantly higher in the control group (P = 0.019). Serum total cholesterol (TC) continuously increased in the control group, whereas it decreased in the HBCR group at 12 months, remaining significantly lower than in the control group overall (P = 0.003). Regarding cardiovascular events, mortality was significantly higher in the control group after 18 months (P = 0.007). Additionally, the rate of return to work after 6 months was significantly higher in the HBCR group (P = 0.020).

CONCLUSION: This study demonstrated that a home-based cardiac rehabilitation program is an effective intervention for patients with CAD, leading to superior clinical outcomes.

Keywords: Home-Based Cardiac Rehabilitation Intervention; Coronary Artery Disease; Lipid Profiles; Anthropometric Indexes

Introduction

Cardiovascular disease (CVD) is an important public health crisis around the world[1]. The incidence of CVD is projected to increase to 25% by 2030, compared to 5% in 2000[2]. CVD is responsible for 17.3 million deaths annually from non-communicable diseases and accounts for 10% of the global burden of disease[1]. It is also the leading cause of mortality and disability-adjusted life years in Iran[3].

With an increasing number of symptomatic CVD patients living longer, the efficacy and availability of health services have become more critical. Cardiac rehabilitation (CR) has become a class I recommendation by the European Society of Cardiology, the American College of Cardiology, and the American Heart Association[4–7]. CR programs include structured exercise training and education focusing on lifestyle and risk factor modification[4–6].

CR has a significant impact on vascular endothelial function, autonomic tone, myocardial oxygen demand, inflammatory markers, clotting and coagulation factors, and the development of collateral coronary vessels[8].

Despite these benefits, patient uptake remains low, with only 30% of eligible individuals participating in a CR program[9,10]. Furthermore, only 50% of participants remain active after completing the CR intervention[10].

Prior studies have shown that various social and environmental barriers contribute to low participation and adherence, such as financial constraints, limited availability and accessibility, low self-efficacy, and time limitations[11,12]. Therefore, a home-based cardiac rehabilitation (HBCR) program may help increase participation rates and ensure long-term adherence. Additionally, such programs have been shown to improve patients' self-efficacy[13,14].

To the best of our knowledge, there is limited research investigating home-based rehabilitation programs in Iran. Therefore, this study aimed to assess the efficacy of a comprehensive HBCR program in promoting health outcomes among Iranian patients with coronary artery disease (CAD).

Methods

Study Design

This study was conducted at the cardiovascular department of Alzahra, Chamran, and Noor Hospitals in Isfahan, Iran, from 2017 to 2019[15]. It was designed as a randomized, double-blind, clinical trial comparing the health promotion parameters of patients receiving the HBCR program (intervention group) with those receiving usual care (control group). The study was approved by the Ethics Committee of Isfahan University of Medical Sciences (IR.MUI.MED.REC.1399.219). Written informed consent was obtained from all participants.

Study Population

Patients aged over 18 years diagnosed with ischemic heart disease were eligible for inclusion. Patients with dementia, uncontrolled cardiac arrhythmia, or walking impairment due to causes other than CAD were excluded. As shown in the study flowchart (Figure 1), 276 patients with CAD were enrolled and randomly assigned to the two groups using a block randomization technique with matched sex and age per block. The care providers, outcome assessors, and data analysts were blinded to the group assignments during the study.

Intervention

Patients in the HBCR group received a home-based rehabilitation program, including a heart-healthy diet, stress management, lifestyle modification, smoking cessation counseling, and individualized exercise programs, alongside routine care. The educational content was developed based on behavioral change models by experts in health education and promotion, cardiology, and sports medicine, in line with the Health Action Process Approach (HAPA). The program also incorporated motivational factors such as outcome expectations, self-efficacy, and risk perception, alongside volitional aspects like action planning and coping planning.

An exercise program was designed for patients using the cardiac care manual handbook and protocols from previous studies. Patients in

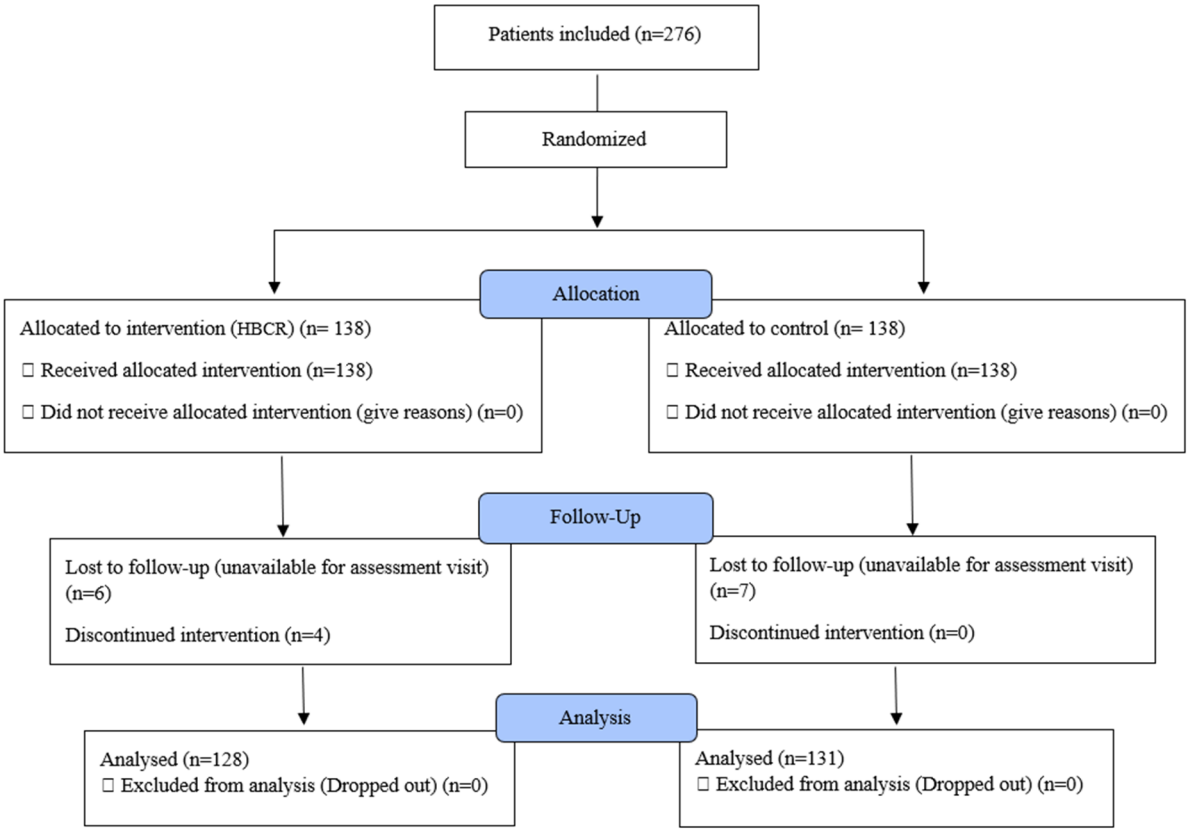

Figure 1. Study Flowchart in CONSORT Format

this group were scheduled to perform regular physical activity based on the initial exercise test (Modified Bruce protocol), three times a week, including a warm-up, moderate-intensity aerobic activity with a gradual increase in duration, and a cool-down phase. Additionally, participants received nutritional, psychological, and smoking cessation counseling sessions. A cardiologist and a sports medicine specialist visited the patients at baseline, 6 months, and 12 months. Patients who could not attend the hospital visits received home visits from trained nurses. Participants were provided with a telephone number to contact the specialists regarding any potential problems.

Control

The control group received standard training courses offered to patients based on the hospital's routine general recommendations. The training materials included a healthy lifestyle, aerobic exercise, nutritional instructions, and cardiovascular advice at subsequent appointments at 6 and 12 months after discharge.

Variables

Demographic and clinical data were gathered using open-ended questions by trained staff. Body mass index (BMI), arterial blood pressure, waist circumference (WC), hip circumference (HC), and serum lipid profile were recorded.

Outcomes, including anthropometric indices and lipid profiles, cardiovascular events, re-admissions, and cardiac-associated deaths, were evaluated at follow-ups.

Data Analyses

SPSS software 20.0 (IBM Corporation, Armonk, NY, USA) was utilized. Categorical data were presented as numbers (percentages), while continuous variables were reported as

mean ± standard deviation (SD). The Kolmogorov-Smirnov test was used to assess the normality of quantitative variables. The Chi-square test (or Fisher's exact test) was employed to examine differences in frequency distributions. Generalized estimating equations (GEE) were used to evaluate the outcomes over the study period. A p-value less than 0.05 was considered statistically significant.

Results

The HBCR and usual care groups consisted of 128 and 131 participants, respectively. Baseline characteristics were not significantly different among groups (Table 1).

Following patients for 12 months revealed that changes in serum low-density lipoprotein (LDL) and arterial blood pressure were not significantly different among groups (P > 0.05) (Table 2).

BMI increased after 6 months and then decreased in 12 months among groups; nevertheless, the reduction was significantly more in the HBCR group (P = 0.004) (Table 2). WC and HC had sharply increased in the intervention group after 6 months. Although, these amounts reduced in this group and increased in the control group in 12 months. Finally, at the endpoint, a better condition was seen for the HC in the HBCR group (P = 0.002) (Table 2).

Changes in high-density lipoprotein (HDL) serum levels were significant (P = 0.030). It increased more after 6 months and then decreased in the 12-month control group. While, it continuously increased in the intervention group. Finally, the serum levels of HDL had improved more in the intervention group (Table 2). Triglycerides (TG) had the same pattern among groups, but had increased more in the control group, overall, at the end of 12 months (P = 0.019). Total serum cholesterol continuously increased in the control group. Although it had reduced in the HBCR group in 12 months (P = 0.003) (Table 2).

GEE results showed that baseline BMI in the control group was significantly higher than the HBCR group at 12 months (P = 0.031). Moreover, HC at 6 months in the control group was significantly higher than the HBCR group at 12 months (P = 0.001). HDL after 6 months in the control group was significantly higher than in the 12-month intervention group (P = 0.008). Furthermore, serum levels of total cholesterol in the control group at baseline and 6 months were higher than 12 months in the intervention group (P < 0.05).

Regarding cardiovascular events, the rehospitalization rate did not differ significantly over time. Mortality was higher among the control group after 18 months (P = 0.007). Also,

Table 1. Baseline Characteristics and Anthropometric Measurements of the Study Participants

Variable	HBCR (N=128)	UC (N=131)	P-value
Age (years), Mean ± SD	56.28±7.95	55.54±6.78	0.421
Gender, N (%)			0.441
Male	110 (85.9)	108 (82.4)	
Female	18 (14.1)	23 (17.6)	
Marital status, N (%)			0.660
Single	3 (2.3)	1 (0.8)	
Married	123 (96.1)	127 (96.9)	
Other	2 (1.6)	3 (2.3)	
Education, N (%)			0.348
Elementary	71 (55.5%)	58 (44.3%)	
Secondary and High School	45 (35.1%)	57 (43.4%)	
University Graduate	12 (9.4%)	16 (12.3%)	
Risk factors, N (%)			
Hypertension	45 (35.2)	40 (30.5)	0.428
Hyperlipidemia	60 (46.9)	42 (32.1)	0.015*
Diabetes	17 (13.3)	23 (17.6)	0.306
Current Smoker, N (%)	27 (52.9)	28 (57.1)	0.800

SD: Standard Deviation. Risk factors included hypertension, Hyperlipidemia, and Diabetes in the study.

Table 2. Comparing the Anthropometric and Lipid Profile Amounts Between Groups at Three Time Points

Variables	Assessment time points, Mean (SE)			P-value
	Baseline	6-month	12-month	
BMI				
UC [a]	27.63(0.38)	27.92(0.40)	27.84(0.41)	0.004*
HBCR	28.37(0.35)	28.48(0.36)	28.19(0.37)	
WC				
UC	99.46(0.89)	99.33(0.95)	100.01(0.96)	0.001*
HBCR [ac]	99.06(0.91)	102.37(1.17)	101.12(0.93)	
HC				
UC [bc]	101.60(0.69)	102.21(0.75)	103.02(0.77)	0.002*
HBCR [ab]	101.79(0.68)	103.58(0.67)	102.39(0.75)	
SBP				
UC	121.41(1.53)	121.97(1.70)	121.11(1.45)	0.639
HBCR	125.63(1.64)	124.44(1.52)	124.67(1.68)	
DBP				
UC	80.08(0.97)	80.77(1.06)	80.99(0.96)	0.520
HBCR	81.73(0.92)	81.31(0.98)	82.59(1.06)	
TG				
UC [b]	151.42(5.36)	142.89(4.64)	155.18(5.29)	0.019*
HBCR	167.50(6.84)	162.86(6.46)	167.90(8.71)	
TC				
UC [bc]	150.23(2.93)	158.94(3.47)	167.11(3.55)	0.003*
HBCR [ab]	154.85(2.90)	167.51(3.60)	160.43(4.17)	
HDL				
UC [ac]	34.87(1.71)	41.69(0.96)	39.66(1.18)	0.030*
HBCR [abc]	33.58(0.86)	37.71(1.11)	40.15(0.70)	
LDL				
UC	82.97(2.74)	86.98(3.01)	88.64(2.92)	0.499
HBCR	83.19(2.44)	82.58(2.90)	84.82(2.80)	

SE: Standard Error, BMI: Body Mass Index, WC: Waist Circumference, HC: Hip Circumference, SBP: Systolic Blood Pressure, DBP: Diastolic Blood Pressure, TG: Triglycerides, TC: Total Cholesterol HDL: High Density Lipoprotein, LDL: Low Density Lipoprotein.
*The significant P-value for Group × Time interaction (The GEE method was used for analyzing repeated measures when response variables are non-normal.)
[a] $P < 0.05$ for the statistical difference from baseline to months 6 within the group.
[b] $P < 0.05$ for the statistical difference from months 6 to months 12 within the group.
[c] $P < 0.05$ for the statistical difference from baseline to months 12 within the group.

back to work after 6 months was significantly more among the intervention group (P = 0.020) (Table 3).

Discussion

Our findings indicated that the home-based rehabilitation program had a good impact on anthropometric indices such as BMI and HC, lipid profile biomarkers, cardiovascular-associated mortality, and also short-term back to work in CAD patients.

A study performed by Nikki Coghill et al. reported that 12 weeks of moderate-intensity walking improves total cholesterol and HDL in hypercholesterolemic men with coronary heart disease[16].

Michael Meyer and others found that doing rehabilitation at home is safe, possible, and a good option instead of supervised cardiac rehab for people of any age with congenital heart disease. However, sticking to the training schedule is a big challenge[17].

Table 3. Events Within 18-months Follow-up

Events	6-month, N (%)			12-month, N (%)			18-month, N (%)		
	UC	HBCR	P-value	UC	HBCR	P-value	UC	HBCR	P-value
Mortality (Yes)	4 (3.4)	2 (1.8)	0.684	0 (0)	1 (0.8)	0.999	7 (5.5)	0 (0)	0.007*
Rehospitalization (Yes)	12 (10.5)	13 (11.7)	0.834	12 (12)	6 (5.1)	0.085	40 (33.3)	36 (27.5)	0.338
Back to Work (No)	9 (7.7)	1 (0.7)	0.020*	3 (3.1)	4 (3.4)	0.999	8 (6.6)	13 (9.9)	0.371

UC: Usual Care, HBCR: Home-based Cardiac Rehabilitation.

Another study found that low-risk CABG patients might have the same or even better performance with a supervised home rehabilitation program compared to one done in a hospital or clinic[18].

Stephan Gielen et al. reported that an HBCR program sustained the impacts of an institution-based program on endothelium-dependent vasodilation in coronary artery disease[19].

Furthermore, Young-Hwa Lee et al. reported that cardiac rehabilitation with home-based physical activity training improved exercise capacity and quality of life compared to conventional care in acute coronary syndrome patients undergoing PCI[20].

While such studies analyzed physical activity capacity according to different parameters, such as the shuttle walk test, oxygen consumption, or total cycle work capacity, all reported that a home-based program improves exercise capacity[21]. The impact of exercise on lipid profiles and the anthropometric indices has been documented in several studies[22].

Over the past decade, multiple meta-analyses have shown the efficacy of home-based rehabilitation programs for CAD patients who have undergone phase II cardiac rehabilitation[23-25]. Similar findings are reported about low-risk patients undergone PCI or CABG, especially in elderly patients[26-28].

These results were similar to ours, indicating that a home-based rehabilitation program can provide better outcomes than usual care. However, some studies show contrasting findings.

A study conducted by Andrea Avila et al. revealed that the HBCR program was as practical as usual care[29]. Additionally, Raquel Bravo-Escobar et al. reported an insignificant difference between traditional cardiac rehabilitation and the home-based intervention regarding lipid profiles and outcomes[30]. These contradictory results may be due to study populations, intervention duration, and techniques.

The limitations of our study included the short follow-up period, small sample size, and also, we did not assess further outcomes such as the quality of life, endothelium-dependent vasodilation, or exercise capacity. Although, this is a preliminary investigation regarding an alternative cardiac rehabilitation program to help cardiologists identify the best rehabilitation choice for CAD patients. Further studies with a larger population and longer follow-up periods are necessary in the future.

Conclusions

This study revealed that a home-based rehabilitation program is an efficient program for patients with coronary artery disease, leading to better outcomes.

Acknowledgements

This study was financially supported by the Technology and Research Development Department of Isfahan Medical Sciences University, Isfahan, Iran. We gratefully acknowledge the dedicated efforts of the investigators, the coordinators, and the volunteer patients who participated in this study.

Conflict of interests

The authors declare no conflict of interest.

Funding

There is no funding in this study.

Author's Contributions

Study Conception or Design: ZTJ
Data Acquisition: NE; SY
Data Analysis or Interpretation: MJ
Manuscript Drafting: NE
Critical Manuscript Revision: ZTJ; FR; HR; HOA; AAM; MS

All authors have approved the final manuscript and are responsible for all aspects of the work.

References

1. Mendis S, Puska P, Norrving B. WHO Global Atlas on Cardiovascular Disease Prevention and Control. Geneva: World Health Organization; 2011.
2. Vanhees L, De Sutter J, GeladaS N, Doyle F, Prescott E, Cornelissen V, Kouidi E, Dugmore D, Vanuzzo D, Börjesson M, Doherty P; EACPR. Importance of characteristics and modalities of physical activity and exercise in defining the benefits to cardiovascular health within the general population: recommendations from the EACPR (Part I). Eur J Prev Cardiol. 2012 Aug;19(4):670-86. https://doi.org/10.1177/2047487312437059
3. Sarrafzadegan N, Mohammmadifard N. Cardiovascular Disease in Iran in the Last 40 Years: Prevalence, Mortality, Morbidity, Challenges and Strategies for Cardiovascular Prevention. Arch Iran Med. 2019 Apr 1;22(4):204-10.
4. Balady GJ, Ades PA, Bittner VA, Franklin BA, Gordon NF, Thomas RJ, et al. Referral, enrollment, and delivery of cardiac rehabilitation/secondary prevention programs at clinical centers and beyond: a presidential advisory from the American Heart Association. Circulation. 2011 Dec 20;124(25):2951-60. https://doi.org/10.1161/CIR.0b013e31823b21e2
5. Smith SC Jr, Benjamin EJ, Bonow RO, Braun LT, Creager MA, Franklin BA, et al. AHA/ACCF secondary prevention and risk reduction therapy for patients with coronary and other atherosclerotic vascular disease: 2011 update: a guideline from the American Heart Association and American College of Cardiology Foundation endorsed by the World Heart Federation and the Preventive Cardiovascular Nurses Association. J Am Coll Cardiol. 2011 Nov 29;58(23):2432-46. https://doi.org/10.1016/j.jacc.2011.10.824
6. Perk J, De Backer G, Gohlke H, Graham I, Reiner Z, Verschuren M, et al. European Guidelines on cardiovascular disease prevention in clinical practice (version 2012). The Fifth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of nine societies and by invited experts). Eur Heart J. 2012 Jul;33(13):1635-701. https://doi.org/10.1093/eurheartj/ehs092
7. Wenger NK, Froelicher ES, Smith LK, Ades PA, Berra K, Blumenthal JA, et al. Cardiac rehabilitation as secondary prevention. Agency for Health Care Policy and Research and National Heart, Lung, and Blood Institute. Clin Pract Guidel Quick Ref Guide Clin. 1995 Oct;(17):1-23.
8. Hambrecht R, Wolf A, Gielen S, Linke A, Hofer J, Erbs S, et al. Effect of exercise on coronary endothelial function in patients with coronary artery disease. N Engl J Med. 2000 Feb 17;342(7):454-60. https://doi.org/10.1056/NEJM200002173420702
9. Barber K, Stommel M, Kroll J, Holmes-Rovner M, McIntosh B. Cardiac rehabilitation for community-based patients with myocardial infarction: factors predicting discharge recommendation and participation. J Clin Epidemiol. 2001 Oct;54(10):1025-30. https://doi.org/10.1016/S0895-4356(01)00375-4
10. Karmali KN, Davies P, Taylor F, Beswick A, Martin N, Ebrahim S. Promoting patient uptake and adherence in cardiac rehabilitation. Cochrane Database Syst Rev. 2014 Jun 25;(6):CD007131. https://doi.org/10.1002/14651858.CD007131.pub3
11. Fernandez RS, Davidson P, Griffiths R. Cardiac rehabilitation coordinators' perceptions of patient-related barriers to implementing cardiac evidence-based guidelines. J Cardiovasc Nurs. 2008 Sep-Oct;23(5):449-57. https://doi.org/10.1097/01.JCN.0000317450.64778.a0
12. Dunlay SM, Witt BJ, Allison TG, Hayes SN, Weston SA, Koepsell E, et al. Barriers to participation in cardiac rehabilitation. Am Heart J. 2009 Nov;158(5):852-9. https://doi.org/10.1016/j.ahj.2009.08.010
13. Poortaghi S, Baghernia A, Golzari SE, Safayian A, Atri SB. The effect of home-based cardiac rehabilitation program on self efficacy of patients referred to cardiac rehabilitation center. BMC Res Notes. 2013 Jul 23;6:287. https://doi.org/10.1186/1756-0500-6-287
14. Bergström G, Börjesson M, Schmidt C. Self-efficacy regarding physical activity is superior to self-assessed activity level, in long-term prediction of cardiovascular events in middle-aged men. BMC

Public Health. 2015 Aug 25;15:820. https://doi.org/10.1186/s12889-015-2140-4
15. Jamalian M, Ansari-Moghaddam A, Roohafza H, Mohammadi M, Vakili L, Abbasi MH, et al. The effect of home-based cardiac rehabilitation on depression score in patients with ischemic heart disease: A longitudinal clinical trial study. ARYA Atheroscler. 2022 Jan;18(1):1-7. https://doi.org/10.48305/arya.v18i0.2407
16. Coghill N, Cooper AR. The effect of a home-based walking program on risk factors for coronary heart disease in hypercholesterolaemic men. A randomized controlled trial. Prev Med. 2008 Jun;46(6):545-51. https://doi.org/10.1016/j.ypmed.2008.01.002
17. Meyer M, Brudy L, García-Cuenllas L, Hager A, Ewert P, Oberhoffer R, et al. Current state of home-based exercise interventions in patients with congenital heart disease: a systematic review. Heart. 2020 Mar;106(5):333-41. https://doi.org/10.1136/heartjnl-2019-315680
18. Arthur HM, Smith KM, Kodis J, McKelvie R. A controlled trial of hospital versus home-based exercise in cardiac patients. Med Sci Sports Exerc. 2002 Oct;34(10):1544-50. https://doi.org/10.1097/00005768-200210000-00003
19. Gielen S, Erbs S, Linke A, Möbius-Winkler S, Schuler G, Hambrecht R. Home-based versus hospital-based exercise programs in patients with coronary artery disease: effects on coronary vasomotion. Am Heart J. 2003 Jan;145(1):E3. https://doi.org/10.1067/mhj.2003.58a
20. Lee YH, Hur SH, Sohn J, Lee HM, Park NH, Cho YK, et al. Impact of home-based exercise training with wireless monitoring on patients with acute coronary syndrome undergoing percutaneous coronary intervention. J Korean Med Sci. 2013 Apr;28(4):564-8. https://doi.org/10.3346/jkms.2013.28.4.564
21. Dalal HM, Zawada A, Jolly K, Moxham T, Taylor RS. Home based versus centre based cardiac rehabilitation: Cochrane systematic review and meta-analysis. BMJ. 2010 Jan 19;340:b5631. https://doi.org/10.1136/bmj.b5631
22. Astengo M, Dahl A, Karlsson T, Mattsson-Hultén L, Wiklund O, Wennerblom B. Physical training after percutaneous coronary intervention in patients with stable angina: effects on working capacity, metabolism, and markers of inflammation. Eur J Cardiovasc Prev Rehabil. 2010 Jun;17(3):349-54. https://doi.org/10.1097/HJR.0b013e3283336c8d
23. Widmer RJ, Collins NM, Collins CS, West CP, Lerman LO, Lerman A. Digital health interventions for the prevention of cardiovascular disease: a systematic review and meta-analysis. Mayo Clin Proc. 2015 Apr;90(4):469-80. https://doi.org/10.1016/j.mayocp.2014.12.026
24. Huang K, Liu W, He D, Huang B, Xiao D, Peng Y, et al. Telehealth interventions versus center-based cardiac rehabilitation of coronary artery disease: A systematic review and meta-analysis. Eur J Prev Cardiol. 2015 Aug;22(8):959-71. https://doi.org/10.1177/2047487314561168
25. Frederix I, Vanhees L, Dendale P, Goetschalckx K. A review of telerehabilitation for cardiac patients. J Telemed Telecare. 2015 Jan;21(1):45-53. https://doi.org/10.1177/1357633X14562732
26. Anderson L, Oldridge N, Thompson DR, Zwisler AD, Rees K, Martin N, Taylor RS. Exercise-Based Cardiac Rehabilitation for Coronary Heart Disease: Cochrane Systematic Review and Meta-Analysis. J Am Coll Cardiol. 2016 Jan 5;67(1):1-12. https://doi.org/10.1016/j.jacc.2015.10.044
27. Scalvini S, Zanelli E, Comini L, Dalla Tomba M, Troise G, Febo O, et al. Home-based versus in-hospital cardiac rehabilitation after cardiac surgery: a nonrandomized controlled study. Phys Ther. 2013 Aug;93(8):1073-83. https://doi.org/10.2522/ptj.20120212
28. Dagenais GR, Rouleau JR, Christen A, Fabia J. Survival of patients with a strongly positive exercise electrocardiogram. Circulation. 1982 Mar;65(3):452-6. https://doi.org/10.1161/01.CIR.65.3.452
29. Avila A, Claes J, Buys R, Azzawi M, Vanhees L, Cornelissen V. Home-based exercise with telemonitoring guidance in patients with coronary artery disease: Does it improve long-term physical fitness? Eur J Prev Cardiol. 2020 Mar;27(4):367-77. https://doi.org/10.1177/2047487319892201
30. Bravo-Escobar R, González-Represas A, Gómez-González AM, Montiel-Trujillo A, Aguilar-Jimenez R, Carrasco-Ruíz R, et al. Effectiveness and safety of a home-based cardiac rehabilitation programme of mixed surveillance in patients with ischemic heart disease at moderate cardiovascular risk: A randomised, controlled clinical trial. BMC Cardiovasc Disord. 2017 Feb 20;17(1):66. https://doi.org/10.1186/s12872-017-0499-0