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Original Paper

Comparing the Impact of Center-based and Home-based Cardiac Rehabilitation on Outcomes in Patients with Coronary Heart Disease: A Meta-analysis of Randomized Controlled Trials

Yanling Li[1*], Fei Zhu[1*], Weifeng Zhang[1], Haiyan Jia[1], Peng Sun[1], Jia Meng[1], Zhaoyu Bi[1#], Kai Wang[1#]

[1] Affiliated Hospital of Hebei University, Baoding, Hebei Province, China

[*] Yanling Li and Fei Zhu should be considered joint First Authors.

[#] Zhaoyu Bi and Kai Wang should be considered joint corresponding authors.

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Abstract

Objective

Home-based cardiac rehabilitation and hospital-based cardiac rehabilitation have had different results in improving quality of life, negative psychology, and blood lipids. The objective of this study was to systematically compare the effectiveness of home-based and hospital-based cardiac rehabilitation in patients with coronary artery disease.

Methods

RCTs related to application of home-based and center-based cardiac rehabilitation in patients with coronary heart disease were searched in multiple e-databases in English and Chinese from January 2000 to March 2025. Two researchers independently screened the articles and extracted the data. Cochrane5.1.0 manual was used to evaluate the quality of the included articles, and RevMan5.4 software was used for Meta analysis.

Results

A total of 1808 patients were included in 14 articles. Meta-analysis showed that cardiac rehabilitation at home and in hospital improved peak oxygen uptake [MD = 0.30, 95% CI (-0.37, 0.97), P=0.38] and systolic blood pressure [MD=1.10, 95% CI (-1.01, 3.21), P=0.31], diastolic blood pressure [MD=0.94, 95% CI(-1.74, 3.62), P=0.49], triglyceride [MD=-0.03,95%CI(-0.15,0.10), P=0.65],fasting glucose [MD=0.15, 95%CI (-0.17,0.47), P=0.35], quality of life and psychological status(P＞0.05), BMI (P＞0.05). Total cholesterol in the hospital-based rehabilitation group was better than that in the home-based rehabilitation group [MD=0.11, 95% CI (0.01,0.21), P=0.03], however the results were *not stable.*

Conclusions

Compared to hospital-based cardiac rehabilitation, home-based cardiac rehabilitation also improves the risk factors in patients with coronary artery disease. However, whether hospital-based cardiac rehabilitation is better than home-based cardiac rehabilitation for total cholesterol needs further validation.

No Patient or Public Contribution.

Keywords

coronary heart disease, home-based, center-based, cardiac rehabilitation, Meta analysis

1. Introduction

Cardiovascular disease (CVD) remains the leading cause of global mortality. Projections indicate a 90.0% increase in CVD prevalence and a 73.4% rise in crude death rates between 2025 and 2050, underscoring its escalating burden [1]. Coronary heart disease (CHD), the second most prevalent CVD, affects approximately 34.5% of 330 million cardiovascular patients in China, as reported in the 2023 Cardiovascular Health and Disease Report [2]. CHD has a serious impact on the quality of life and psychological state of patients, while aggravating the social and economic burden. Although the current effective treatment means of coronary intervention (Percutaneous coronaryintervention, PC) and coronary artery bypass grafting (Coronary artery bypass grafting, CABG) can effectively improve the ischemic symptoms of patients and reduce the acute stage of the disease and death rate [3], However, it does not address the underlying factors that lead to the occurrence and development of CHD, the key to safeguarding patients' long-term quality of life depends on the secondary f prevention and control, which is lifestyle change and control of risk factors. The effectiveness of cardiac rehabilitation (CR), as a personalized and scientific rehabilitation program integrating five major prescriptions: drugs, exercise, nutrition, psychology and lifestyle change, in reducing mortality and improving quality of life of patients with CHD has been clearly demonstrated [4-6]. As patients need to receive professional healthcare staffs to develop rehabilitation programs after assessment, CR was initially carried out in hospitals only, i.e., Center-based cardiac rehabilitation (CBCR), but the participation rate of CBCR is low due to time constraints, transportation inconvenience, economy, and healthcare insurance policies. Studies have shown that the highest participation rate in CR worldwide is less than one-half [7]. Our country faces the same problem [8]. In order to solve the above deficiencies, researchers developed the home-based cardiac rehabilitation (HBCR) model. HBCR provides more personalized rehabilitation programs according to patients' preferences and needs, and improves patients' compliance with rehabilitation through remote teaching by healthcare personnel and indirect exercise supervision at home [9]. Several national and international researchers have explored the efficacy of HBCR and concluded, based on adequate evaluation of patients, that it has similar effects to CBCR [10-12], however the results of the studies vary with respect to certain specific indicators, such as improvement in quality of life, anxiety and depression scores, and changes in blood lipids [13]. In order to further explore the effects of HBCR versus CBCR in patients with CHD, this study included relevant randomized controlled studies for Meta-analysis, with the aim of providing evidence-based evidence to support the promotion of a HBCR model suitable for China.

2. Methods

PROSPERO is an international database of prospective registry system reviews in health and social care, and we describe the protocol for meta in PROSPERO (registration number: CRD420251003137) [14]. We report reviews according to the guidelines in the Cochrane Handbook [15].

2.1 Literature Search and Eligibility Criteria

Two authors (ZHU and LI) systematically searched PubMed, Web of Science, Embase, Cochrane Library, CNKI, Wanfang, VIP, and CBM databases (January 2000–March 2025). Search terms combined MeSH terms and free words (e.g., “home-based cardiac rehabilitation,” “center-based cardiac rehabilitation,” “coronary heart disease”).

A literature search and all analyses were performed according to the Cochrane Collaboration and PRISMA statements [16]. The authors confirm that patient consent does not apply to this article.

We included adults (≥18 years of age) from hospitals or the community who had CHD and underwent CR, including patients with angina, myocardial infarction, or percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG). Our study was confined to randomized controlled trials comparing home versus center-based cardiac rehabilitation, and the duration of the intervention was ≥6 weeks, more than 2 times per week, with ≥15 minutes of exercise per session.

2.2 Exclusion Criteria

The abstracts of papers, conference presentations or posters, letters to the editor, or papers in languages other than English and Chinese were excluded.

2.3 Outcomes of Interest

We focused on outcome indicators: activity endurance (peak oxygen uptake, 6-min walking distance); cardiovascular risk factor indicators (blood pressure, lipids, blood glucose, body mass index), quality of life indicators (SF-36, etc.), and psychological state indicators (anxiety, depression scores).

2.4 Literature Quality Assessment and Data Extraction

Two researchers familiar with Meta-analysis and uniformly trained independently assessed the literature, and a third researcher was consulted in case of disputes. Data extraction included authors, year of publication, country, study sample size, intervention methods, and outcome indicators. The Cochrane 5.1.0 Handbook [15] was used to evaluate the quality of the included studies.

2.5 Statistical Analysis

RevMan 5.4 software was used for statistical analysis. Studies were organized according to the results of each outcome indicator of the intervention, with the effect indicators being continuous variables, with mean or standard deviation as the effect scales. Heterogeneity was assessed using I^2 and was considered significant at p<0.1. I^2 = 0%-30% heterogeneity was minimal, I^2 = 30-50%, heterogeneity was moderate, I^2 = 50-90%, heterogeneity was large, and > 90%, heterogeneity was considered considerable [17]. When $P > 0.1$, $I^2 < 50\%$ indicated that there was no obvious heterogeneity among independent studies, and fixed effect model was used; when $P \leq 0.1$, $I^2 \geq 50\%$ indicated that there was greater heterogeneity among independent studies, and random effect model was used. The CR effects were calculated as the difference between intervention outcomes from baseline to the end of follow-up.

3. Results

3.1 Study Characteristics

The 1240 literature were retrieved from the database, and after screening, 14 literature were finally included [18-31], and the process of literature screening is shown in Figure 1.

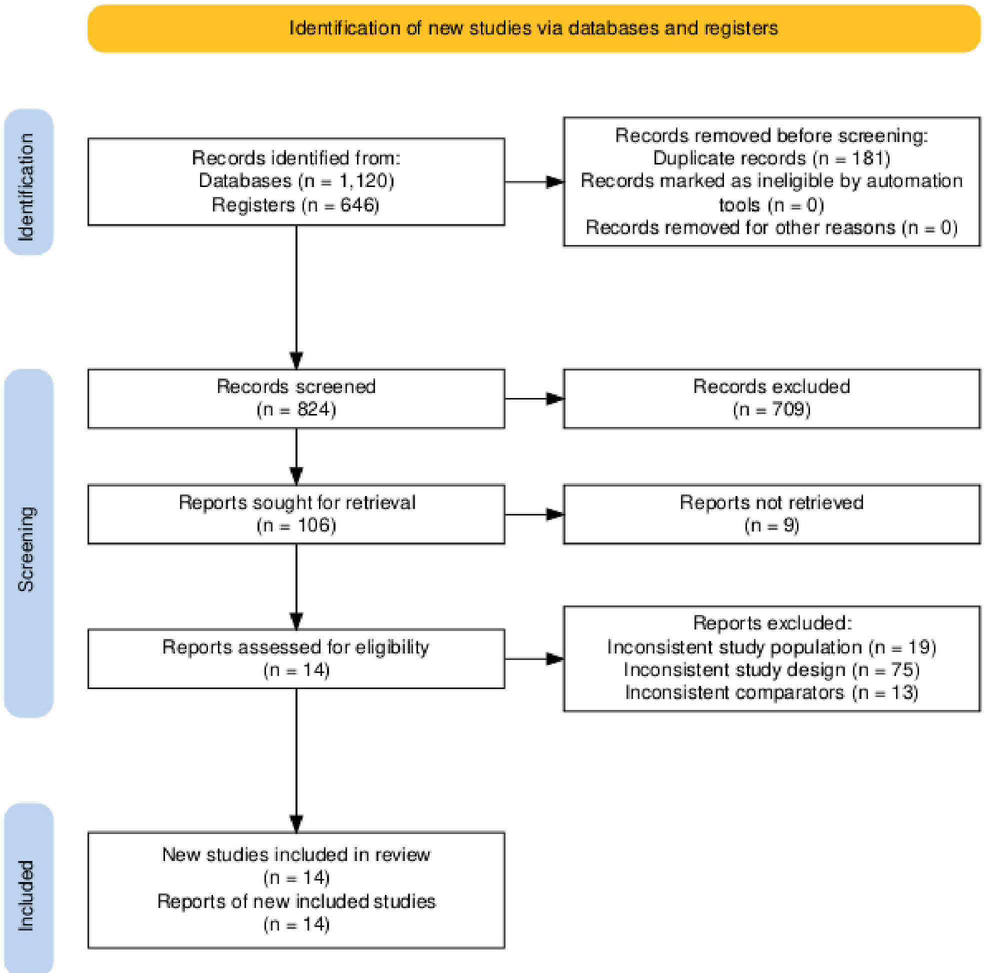

Figure 1. PRISMA Flow Diagram of the Study Screening Process

Fourteen literatures with a total of 1808 patients were included in the study, including 909 patients in the HBCR group and 899 patients in the CBCR group. One of the literature [19] was divided into three groups for randomized controlled trials, and except for the HBCR group, the other two groups met the conditions for CBCR inclusion, therefore it was split into two groups (Aamot I et al-A & Aamot I et al-B) for quantitative analysis respectively. Due to this type of intervention-based study could not be blinded to intervention implementers and patients, only the item of blinding for literature quality assessment methods was evaluated for data measurer blinding. The basic characteristics of the literature are shown in Table 1, and the details of bias risk assessment, see Figure 2 and Figure 3.

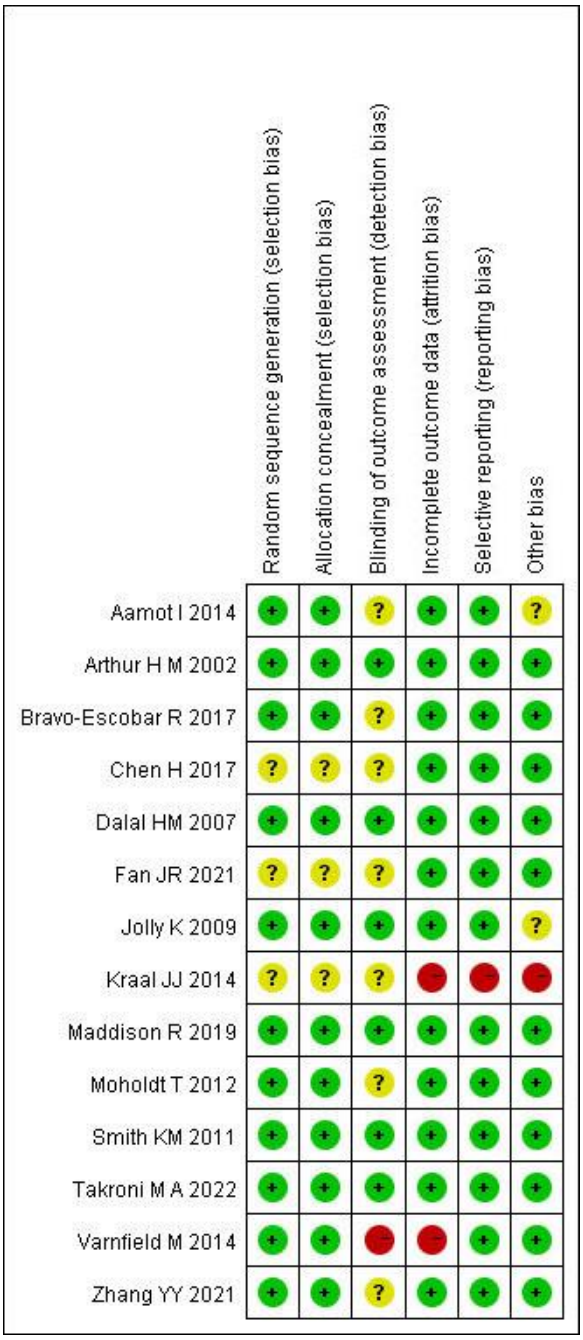

Figure 2. Risk of Bias Summary

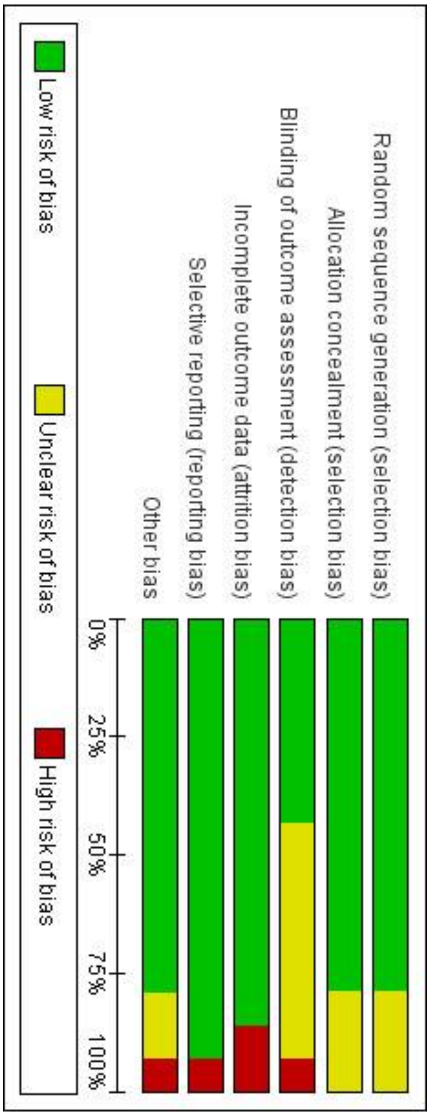

Figure 3. Risk of Bias Graph

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Table 1. The Basic Characteristics of the Studies

Study	Participants	Number		age		Duration of intervention and follow-up	Interventions		Comparative indicators
		HBCR group	CBCR group	HBCR group	CBCR group		HBCR group	CBCR group	
Jolly K et al[18]	Coronary heart disease patients after myocardial infarction or revascularization	263	262	60.3±10.5	61.8±11.0	12 months 12 months	*Heart Manuals* were distributed, and patients were encouraged to gradually increase exercise to achieve at least 15 minutes of moderate-intensity activity daily, with home visits at 10 days, 6 weeks, and 12 weeks of the home intervention and 3 weeks of telephone follow-up.	Programs varied across the four hearts and included 9 sessions per week, 12 sessions over 8 weeks, and 24 individualized sessions over 12 weeks. Exercise time 25-40min	②③⑤⑥⑫
Aamot I et al-A[19]	Patients with myocardial infarction, revascularization, acute coronary syndrome	28	28	58.0±8.0	58.0±8.0	3 months 12 months	Standardized exercise intensity and heart rate monitor use training, participants chose their preferred exercise at home but maintained the intensity of previously trained exercise, supervised by an administrator. HIT was performed twice a week for 12 weeks	Exercise in groups of 10-15 people, guided by a physical therapist. Perform circuit training and interval exercises. Perform HIT twice a week for 12 weeks	①②⑤
Aamot I et al-B[19]	Patients with myocardial infarction, revascularization, acute coronary syndrome	28	34	58.0±8.0	56.0±9.0	3 months 12 months	Standardized exercise intensity and heart rate monitor use training, participants chose their preferred exercise at home but maintained the intensity of previously trained exercise, supervised by an administrator. HIT was performed twice a week for 12 weeks	A small group of 3 to 7 patients used a treadmill in the hospital with a self-selected running pattern. HIT was performed twice a week for 12 weeks	①②⑤
Moholdt T et al[20]	Patients who underwent CABG 4 - 8 weeks ago and are clinically	14	16	61.7±8.0	63.6±7.3	6 months 6 months	Prior 1-hour training + standardized program of home exercise (3 times/week) Individualized form of exercise + lifestyle guidance	Hospital rehabilitation program (including dietary guidance, smoking cessation, lifestyle improvement, exercise, etc.), identical exercise program	①③④⑤

	stable								
Arthur H M et al[21]	Patients stabilized after CABG for coronary artery disease	120	122	64.2±9.4	62.5±8.8	6 months 6 months	1 hour personalized exercise consultation + 5 times/week standardized exercise + exercise diary to record activity time and heart rate + phone follow-up by exercise specialist every 1 time/2 weeks + regular monitoring	3 times/week, sessions are supervised by an exercise specialist. Standardized exercise programme	①⑤
Varnfield M et al[22]	Stabilized patients with coronary heart disease after myocardial infarction	53	41	54.9±9.6	56.2±10.1	6 weeks 6 months	Weekly phone coaching to monitor weight, blood pressure, sleep, diet and more. Standardized exercise regimen + data backend synchronization + individualized recommendations. Two-week intervention	2 times/week, 1 hour/session of educational sessions + 2 times/week of exercise rehabilitation (in the same manner and with the same intensity)	②③⑦
Kraal J J et al[23]	Patients undergoing PCI or CABG for coronary artery disease	25	25	60.6± 7.5	56.1± 8.7	3 months 3 months	2-3 times/week, individualized exercise + weekly phone follow-up by physical therapist + real-time back-office monitoring + lifestyle intervention	Exercise intensity time same as intervention group, on-site supervision by hospital physical therapist + lifestyle intervention	①⑤
Dalal HM et al[24]	Patients with stable myocardial infarcts	50	34	60.6±10.1	64.3±11.2	6-8weeks 9 months	Home visit in the 1st week after discharge + weekly telephone follow-up + exercise + health education according to the individualized booklet issued	Instruction and supervision by the rehabilitation team weekly (same exercise program) + health education	③⑤⑥
Smith KM et al[25]	Patients undergoing CABG for coronary artery disease	70	74	70.26±10.7	70.36±8.26	6 months 6years	Home visit in the 1st week after discharge + telephone follow-up weekly + exercise + health education according to the individualized manual issued	Provision of standardized exercise prescription, smoking cessation, psychological counseling, diabetes nutritional guidance and lipid management	①⑧⑨⑪
Maddison R et al[26]	Patients with stable coronary artery disease	82	80	61.0±13.2	61.5±12.2	3 months 6 months	Remote Rehabilitation Platform Provides Personalized Exercise Prescriptions, Real-Time Exercise Monitoring	Supervised Exercise by Clinical Exercise Physiologists in a Cardiac Rehabilitation Clinic	①②③④⑤⑧
Bravo-Escobar R	Low- and intermediate-risk	13	14	56.50±6.01	55.64±11.35	2 months 2 months	Supervised (remote monitoring device) exercise cardiac	Rehabilitation exercise program in hospitals 3 times per week	②③④⑤⑧⑨⑪

et al[27]	coronary artery disease patients after PCI or CABG						rehabilitation once a week. 15min warm up, 30min aerobic, 15min relaxation.		
Fan JR et al[28]	Patients after PCI for acute myocardial infarction	25	24	54.10±10.01	55.19±11.17	3 months 3 months	Training & Assessment + Wearing of Electronic Monitoring Devices + Standardized Exercise Prescription + Telephone WeChat Follow-ups	Full doctor's guidance + standardized exercise regimen + weekly sessions	①⑤⑥⑩
Zhang YY et al[29]	Patients with stable coronary heart disease	92	99	56.0±9.9	53.6±11.0	3 months 3 months	Individualized program after assessment + wearing electronic monitoring devices + performing rehabilitation exercises + weekly telephone follow-ups	Individualized program after assessment + exercise rehabilitation under hospital supervision, 3 times / week	①
Chen H et al[30]	Patients undergoing PCI for coronary artery disease	21	22	57.2±5.7	57.9±7.6	3 months 3 months	Routine treatment + exercise prescription (36 regular exercise rehabilitation sessions at home) + telephone follow-ups	Conventional therapy + exercise prescription (outpatient rehabilitation)	①②③④⑧⑩
Takroni M A et al[31]	Patients at intermediate risk following PCI for coronary artery disease	25	24	57±7.71	54±7.51	2 months	Cardiovascular Rehabilitation Exercise Kit + Exercise Schedule + Wearing Electronic Equipment + Weekly Phone Calls, 3 times/week	Post-training monitoring of personalized exercise + wearing of electronic monitoring devices, 3 times/week	⑤⑥⑫

Notes. ①peak oxygen uptake; ②blood pressure; ③blood lipids; ④blood glucose; ⑤quality of life; ⑥psychological state; ⑦6-min walking test; ⑧body index; ⑨waist-to-hip ratio; ⑩anaerobic threshold; ⑪metabolic equivalent; ⑫shuttle walking test.

Abbreviations: CABG, coronary artery bypass graft; PCI, percutaneous coronary intervention; HIT, high-intensity interval training;

2.3 Results of Meta-analysis

2.3.1 Peak Oxygen Uptake

Nine papers [19-21, 23, 27-31] reported the effect on peak oxygen uptake. Heterogeneity among studies was low (I^2=0, *P*=0.48), and using a fixed-effects model, the results showed that the difference in peak oxygen uptake between the two groups was not statistically significant when compared [MD = 0.30, 95% CI (-0.37, 0.97), Z = 0.88, *P* = 0.38], as shown in Figure 4.Sensitivity analysis excluded one study with the largest weighting[29] (45.4%), which showed stable results with MD = -0.11, 95% CI (-1.02,0.80), Z = 0.23, *P* = 0.82.

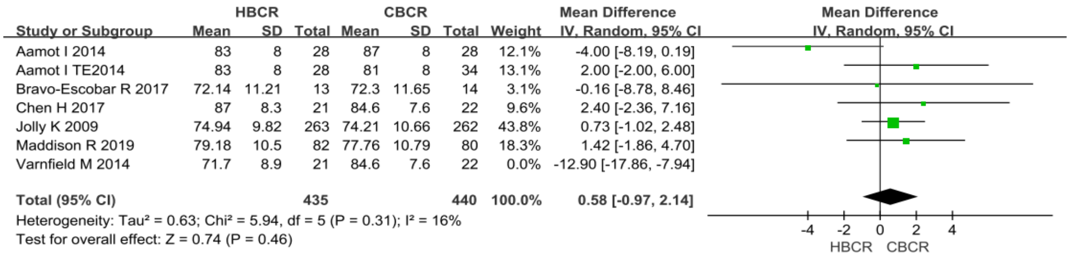

Figure 4. Forest Plots for Peak Oxygen Uptake

2.3.2 Blood Pressure

2.3.2.1 Systolic blood pressure

Seven papers [18, 19, 22, 25, 30, 31] reported the effect on systolic blood pressure (SBP). Heterogeneity among studies was low (I^2=0, *P*=0.91), and using a fixed-effects model, the results showed that there was no statistically significant difference in systolic blood pressure comparing the two groups [MD=1.10, 95% CI (-1.01, 3.21), Z=1.02, *P*=0.31], as shown in Figure 5. Sensitivity analyses excluded one study[18] that accounted for the largest weight (38%). The results showed stable results with MD=0.94, 95% CI (-1.74,3.62), Z=0.69, *P*=0.49.

2.3.2.2 Diastolic blood pressure

Seven papers [18, 19, 22, 25, 30, 31] reported the effect on diastolic blood pressure (DBP). There was heterogeneity among the studies (I^2 = 56%, *P* = 0.03) and using a random effects model, the results showed that the difference in diastolic blood pressure was not statistically significant when comparing the two groups [MD = -0.32, 95% CI (-2.42, 1.79), Z = 0.29, *P* = 0.77], as shown in Figure 6. Sensitivity analyses excluded one study with the largest weight [18, 22] (23.4%), which showed stable results with MD=-0.60, 95% CI (-3.35,2.14), Z=0.43, *P*=0.67.

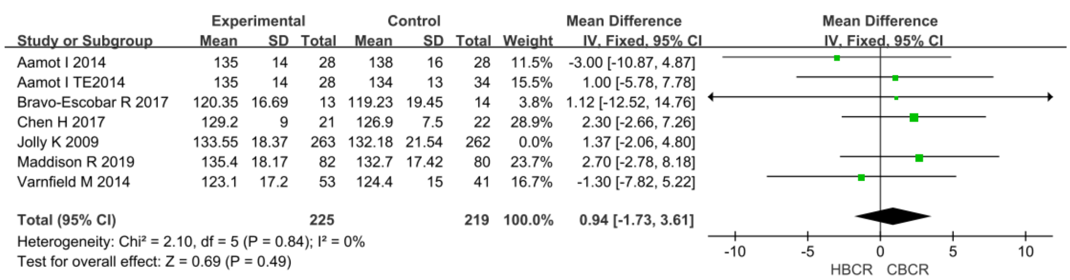

Figure 5. Forest Plots for Systolic Blood Pressure

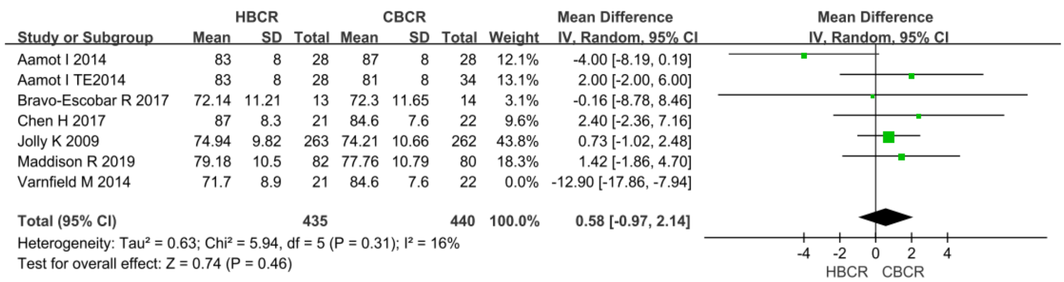

Figure 6. Forest Plots for Diastolic Blood Pressure

2.3.3.1 Total cholesterol

Seven papers [18, 20, 22, 24, 25, 30, 31] reported effects on total cholesterol. Heterogeneity among studies was low (I^2=0, P=0.94), and using a fixed-effects model, the results showed that there was no statistically significant difference in total cholesterol comparing the two groups [MD=0.11, 95% CI (0.01, 0.21), Z=2.12, *P*=0.03]. Sensitivity analysis excluding one of the most weighted studies[18] (45.6%) showed unstable results with MD=0.11, 95% CI (-0.03,0.24), Z=1.54, P=0.12, see Figure 7.

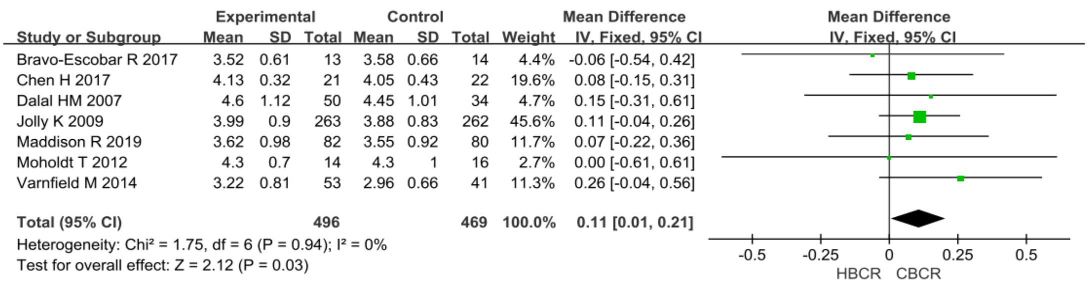

Figure 7. Forest Plots for Total Cholesterol

2.3.3.2 Low-density lipoprotein

Four papers [22, 25, 30, 31] reported effects on low-density lipoprotein (LDL). Heterogeneity existed between studies (I^2=59%, *P*=0.06) and using a random effects model, the results showed that the difference in LDL between the two groups was not statistically significant [MD=-0.01, 95% CI (-0.19, 0.18), Z=0.05, *P*=0.96]. Excluding one article with the largest possible source of heterogeneity [31] (24.3%), the results showed low heterogeneity (I^2=12%, *P*=0.32) and stable results (Z=1.09, *P*=0.27), see Figure 8.

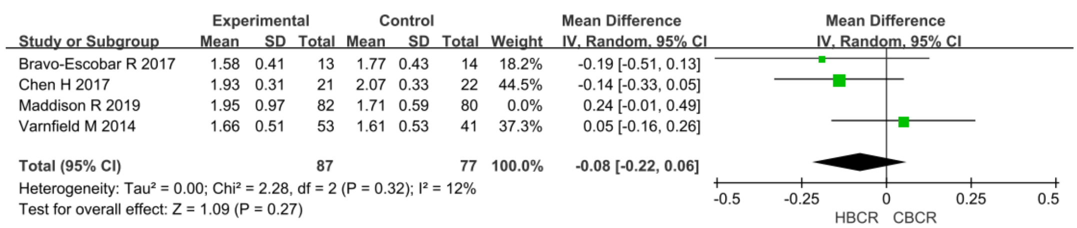

Figure 8. Forest Plots for Low-density Lipoprotein

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2.3.3.3 High-density lipoproteins

Six papers [18, 20, 22, 25, 30, 31] reported effects on high-density lipoproteins (HDL). Heterogeneity existed between studies (I^2 = 92%, P < 0.001), and using a random-effects model, the results showed no statistically significant difference in HDL comparing the two groups [MD = 0.06, 95% CI (-0.09, 0.22), Z = 0.78, P = 0.44]. Excluding the two articles with the greatest possible sources of heterogeneity [18,25]. The results showed low heterogeneity (I^2=0, P=0.53) and no statistically significant difference in HDL comparison between the two groups [MD=0.01, 95% CI (-0.04, 0.05), Z=0.29, P=0.77], which stabilized the results, see Figure 9.

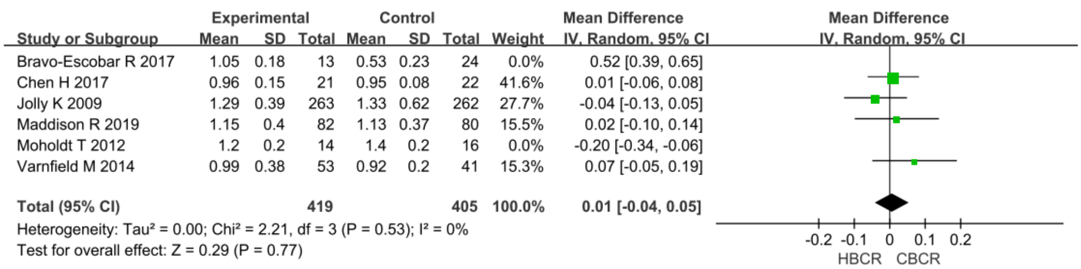

Figure 9. Forest Plots for High-density Lipoproteins

2.3.3.4 Triglycerides

Five papers [20, 22, 25, 30, 31] reported effects on triglycerides. Heterogeneity among studies was low (I^2=0, P=0.76), and using a fixed-effects model, the results showed that there was no statistically significant difference in the comparison of triglycerides between the two groups [MD=-0.03,95% CI (-0.15,0.10), Z=0.45, P=0.65]. Sensitivity analysis excluding one of the most weighted studies [30] (57.2%) showed stable results with MD=-0.05, 95% CI (-0.24,0.14), Z=0.56, P=0.58, see Figure10.

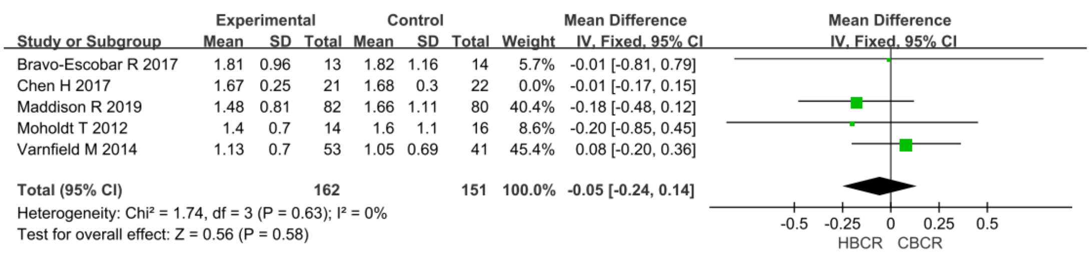

Figure 10. Forest Plots for Triglycerides

2.3.4 Blood Glucose

2.3.4.1 Fasting glucose

Four paper [20, 25, 30 31] reported the effect on fasting glucose. Heterogeneity among the studies was low (I^2=0, P=0.62), and using a fixed-effects model, the results showed that there was no statistically significant difference in the comparison of fasting glucose between the two groups [MD=0.15,95% CI

(-0.17,0.47), Z=0.93, *P*=0.35], as shown in Figure 11.Sensitivity analysis excluded one study [30] that had the greatest weighting (33.4%), which showed stable results with MD=0.12, 95% CI (-0.27,0.52), Z=0.59, *P*=0.56.

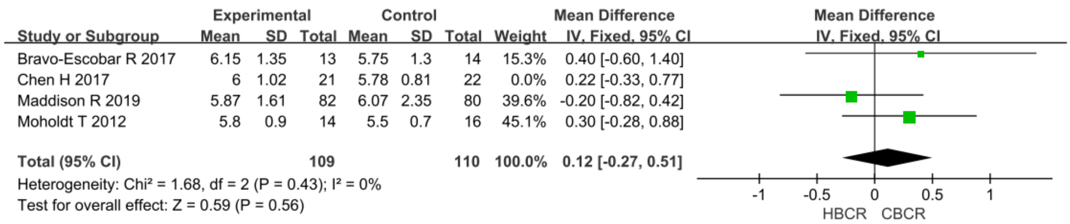

Figure 11. Forest Plots for Fasting Glucose

2.3.4.2 Glycated hemoglobin

Three papers [20, 25, 30] reported the effect on glycated hemoglobin. Heterogeneity was present among the studies (I^2=53%, *P*=0.12) and using a random effects model, the results showed no statistically significant difference in the comparison of glycated hemoglobin between the two groups [MD=0.15,95% CI (-0.13,0.43), Z=1.04, *P*=0.30], as shown in Figure 12. excluding one study [20] which had the highest weighting (49.5%). The results showed low heterogeneity (I^2=11%, *P*=0.29), MD=-0.10, 95% CI (-0.49,0.29), Z=0.50, *P*=0.61 and stable results.

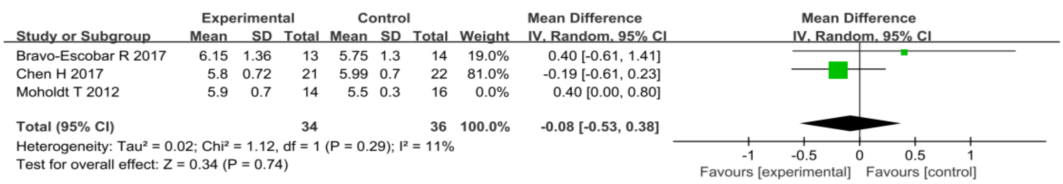

Figure 12. Forest Plots for Glycated Hemoglobin

2.3.5 Quality of Life Psychological State and BMI

Three papers [20, 23, 24] reported the effect on quality of life using Mac New scale with acceptable heterogeneity and analyzed using fixed effect model, the results showed no statistically significant difference (P > 0.05), see Figure 13.

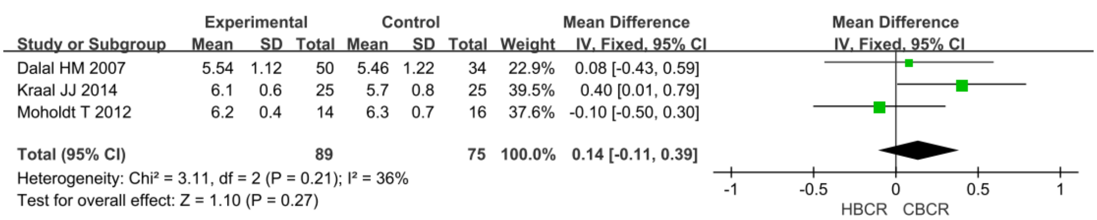

Figure 13. Forest Plots for Psychological State by Mac New Scale

Three papers [18, 24, 26] reported the effect of exercise on patients' psychological state using HADS scale with high heterogeneity and analyzed using random effects model, the results were not statistically significant (*P* > 0.05), excluding one study [26] (49.5%) which had the largest weight, the results showed low heterogeneity (I^2 = 15%, *P* = 0.28), MD = -0.62, 95% CI (-0.13,1.36), Z = 1.62, *P* = 0.10, and the results were stable, as shown in Figure 14.

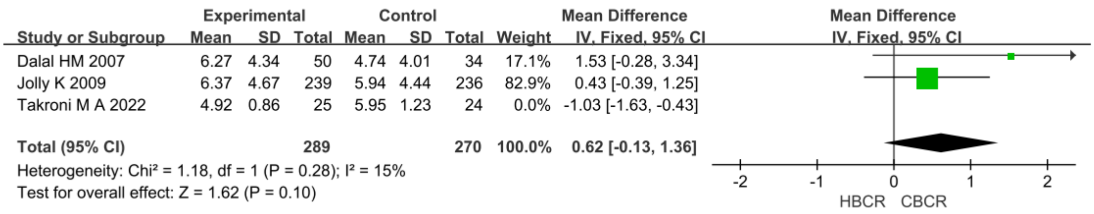

Figure 14. Forest Plots for Psychological State by HADS

Four literatures [25, 27,30, 31] reported the effect on BMI with high heterogeneity (I^2=59%, *P*=0.06), analyzed by random effects model, the results showed MD=-0.59, 95%CI (-1.75,0.58), Z=0.00, P=0.32. Further sensitivity analyses were performed by excluding the studies with the highest weighting [30], which showed low heterogeneity (I^2=0%, P=0.66), MD=-1.24, 95%CI (-2.18,-0.31), Z=2.60, *P*=0.009, and a stable result, as shown in Figure 15.

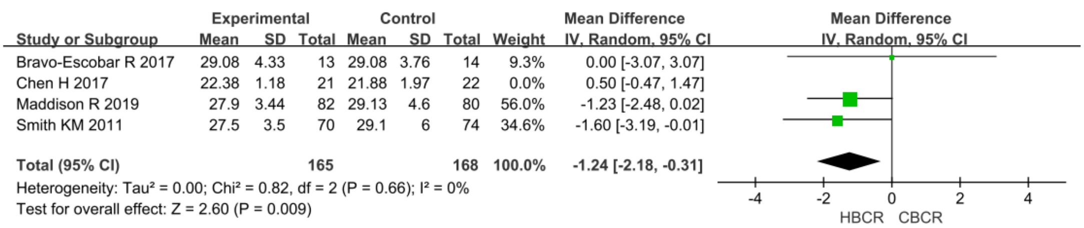

Figure 15. Forest Plots for BMI

3. Discussion

3.1 Methodological Quality of the Included Literature

A total of 14 papers were included, including 10 papers in English and 3 papers in Chinese. Eleven of the included studies [18-22, 24, 25-27, 29, 31] described detailed randomized grouping methods with correct methodology. And allocation concealment was used in the grouping. Blinding is very important in the quality assessment of randomized controlled studies [32], however some studies, especially in nursing, are more difficult to implement double or triple blinding. Only six of the randomized controlled trials included in this study [18, 21, 24, 27, 31] blinded the data measurers. All included studies reported loss to follow-up and dropout, and all selectively reported study outcomes as low risk. The control group of the study by Jolly K et al. [18] was cardiac rehabilitation in four central hospitals with slight differences in interventions between centers and other biases were high risk. the study by

Kraal JJ et al. [23] was inconsistent in the frequency of exercise in the two groups, the rest of the studies had complete data for general information comparison and were comparable.

3.2 Equivalent Effects of Different Cardiac Rehabilitation Modalities on Activity Endurance

Cardiac rehabilitation training helps to improve the cardiac function and exercise endurance of patients, and HBCR and CBCR are comparable in improving the prognosis of patients and exercise endurance [33], the results of the present study showed that the difference in peak oxygen uptake between the two groups of patients was not statistically significant, and the results were stable and reliable by sensitivity analysis. 2021 Singapore A Meta-analysis exploring the effects of phase II home-based cardiac rehabilitation showed greater exercise tolerance in the home-based rehabilitation group compared to usual care [34]. One of the literature included in this study [22] compared the 6min walking distance between the two groups and showed a 95% CI [-35.0,14.63], P=0.40.Other studies[34-35] have reached the same conclusion. In the literature included in this study, both HBCR and CBCR are individualized rehabilitation programs based on exercise training combined with dietary guidance, lifestyle intervention, and risk factor control. And exercise can improve patients' cardiac function to a certain extent, strengthen the elasticity of blood vessel wall, and improve patients' exercise endurance, which is manifested by the increase of 6min walking distance and the increase of peak oxygen uptake [36]. It has been noted that peak oxygen uptake in patients with coronary artery disease improves by nearly 20% after 3 to 6 months of cardiac rehabilitation [33]. It is worth noting that the specific interventions between the studies within the two groups are also different, and the actual application should be fully integrated with the actual situation of the patients.

3.3 The Effect of Different Cardiac Rehabilitation Modes on Cardiovascular Risk Factors

The latest report on cardiovascular health and disease in China states that measures should be taken to intervene in cardiovascular disease risk factors such as hypertension, dyslipidemia, diabetes mellitus, obesity, and smoking in order to maximize population health [2]. High-risk factors for coronary heart disease can be effectively controlled through cardiac rehabilitation [37]. The results of this study showed comparable effects of home-based cardiac rehabilitation and hospital-based cardiac rehabilitation in terms of lowering blood pressure, triglycerides, fasting glucose, and BMI. This is consistent with the findings of previous studies [34]. Comparison of total cholesterol between the two groups showed no significant heterogeneity in the combined group, indicating that the hospital cardiac rehabilitation group was able to achieve better results. However, further sensitivity analysis was performed and the results were unstable. Comparing HDL and LDL between the two groups, the difference was not statistically significant, but there was heterogeneity, which could be reduced by subgroup analysis. This result may be related to factors such as insufficiently large sample size of included studies and inconsistent intervention follow-up time between studies. This suggests the need for large samples and rigorous randomized controlled studies to further complement the results.

3.4 Impact of Different Cardiac Rehabilitation Modes on Quality of Life and Psychological Status

Coronary artery disease is a chronic disease, and whether or not a patient experiences an acute coronary event, it will have a certain impact on his or her psychological status and quality of life. Studies have shown that myocardial infarction combined with untreated depression has a 70%-90% higher risk of death at one year than without depression [26]. Depression, in turn, leads to a decrease in patients' quality of life [38]. Cardiac rehabilitation can improve clinical symptoms and promote patients to return to normal life, and through psychological guidance, health education, and relaxation training by professionals, it helps patients to maintain a positive and optimistic attitude, which in turn promotes the recovery of the disease. The results of this study showed no difference between different cardiac rehabilitation modes in improving patients' quality of life and relieving anxiety. Heterogeneity is low, but the two quantities are small due to different survey scales used in different studies, so large-sample studies are still needed to further supplement the results. There are also studies abroad that have reached the same conclusion [39-40]. When exploring the home-based cardiac rehabilitation model suitable for China, it is important to pay attention to the changes in the psychological state of the patients, and it is recommended that the cardiac rehabilitation team increase the number of psychology professionals if conditions permit.

4. Limitations

The study has certain defects, the quality of the included Chinese literature is low, and the interventions are not exactly the same among the studies, which may have a certain impact on the results of the study. However, overall, home-based cardiac rehabilitation is safe and effective for patients with stable coronary artery disease, and home-based cardiac rehabilitation may provide more options for patients with stable coronary artery disease who lack available hospital-based cardiac rehabilitation services. However, it should also be noted that long-term studies of the impact of home cardiac rehabilitation on clinical events are still lacking.

5. Conclusion

The results of this study show that home cardiac rehabilitation is equally effective compared with hospital cardiac rehabilitation. It can increase peak oxygen uptake and improve coronary risk factors in patients with coronary heart disease. However, for total cholesterol, whether hospital cardiac rehabilitation is superior to home cardiac rehabilitation still needs further verification. However, the results of this study are stable and reliable, and provide some implications for exploring a suitable cardiac rehabilitation model for China.

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