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**Table S1** Risk of bias of included studies

| Author, year | Random sequence generation (selection bias) | Allocation concealment (selection bias) | Blinding of participants and personnel (performance bias) | Blinding of outcome assessment (detection bias) | Incomplete outcome data (attrition bias) | Selective reporting (reporting bias) | Other bias |
|---|---|---|---|---|---|---|---|
| Hambrecht, R., 2000 (1) | Low | Unclear | Low | Unclear | Low | Low | Low |
| Oka, R. K., 2000 (2) | Low | Low | Low | Low | High | Unclear | Low |
| Pu, C. T., 2001 (3) | High | Low | Low | Low | Low | High | Low |
| Willenheimer, R., 2001 (4) | Low | Low | Low | Low | Low | Low | Low |
| Parnell, M. M., 2002 (5) | Low | Low | Unclear | Low | Low | Low | Low |
| Giannuzzi, P., 2003 (6) | Unclear | Low | Low | Unclear | Low | Low | Low |
| Gielen, Stephan, 2003 (7) | Low | Low | Unclear | Low | Low | Unclear | Low |
| Pozehl, Bunny, 2003 (8) | Low | Low | Low | Low | Low | Low | Low |
| Corvera-Tindel, T., 2004 (9) | Low | Unclear | Low | Low | Unclear | Low | Low |
| Koukouvou, Georgia, 2004 (10) | Low | Unclear | Unclear | Low | Low | Unclear | Low |
| Sabelis, L. W., 2004 (11) | Low | Low | Low | Low | High | Unclear | Low |
| van den Berg-Emons, Rita, 2004 (12) | Low | Low | High | Unclear | Low | Unclear | Low |
| Yeh, Gloria Y., 2004 (13) | Unclear | Low | Low | Unclear | Unclear | Low | Low |
| Senden, P. Jeff, 2005 (14) | High | Low | High | Low | Low | Low | Low |
| Belardinelli, R., 2006 (15) | Low | Unclear | Unclear | Unclear | Low | Low | Low |
| Dall'Ago, Pedro, 2006 (16) | Unclear | Unclear | Unclear | Low | Low | Unclear | Low |
| de Mello Franco, F. G., 2006 (17) | Low | Low | Low | Low | High | Low | Low |
| Dimopoulos, Stavros, 2006 (18) | Unclear | Unclear | Low | Low | Unclear | High | Low |
| Jónsdóttir, Sólrún, 2006 (19) | High | High | Low | Low | High | Low | Low |
| Maria Sarullo, Filippo, 2006 (20) | Low | Unclear | Unclear | Low | Unclear | Low | Low |
| Passino, Claudio, 2006 (21) | Low | Low | Low | Low | High | Unclear | Low |
| Dracup, K., 2007 (22) | Unclear | High | Low | Low | Low | Low | Low |
| Feiereisen, P., 2007 (23) | Unclear | Unclear | Low | Low | High | Low | Low |
| Klecha, Artur, 2007 (24) | Low | Unclear | Unclear | Low | Low | Unclear | Low |
| Mueller, Lionel, 2007 (25) | Low | Low | Unclear | Low | Low | Low | Low |
| Myers, J., 2007 (26) | Unclear | Low | Unclear | Low | Low | Low | Low |
| Wisløff, Ulrik, 2007 (27) | Low | Low | Low | Low | Low | Low | Low |
| Beckers, Paul J., 2008 (28) | Unclear | Unclear | Low | Low | Low | High | Low |
| Beer, M., 2008 (29) | High | High | Unclear | Unclear | Low | Unclear | Low |
| Giallauria, Francesco, 2008 (30) | Unclear | Unclear | High | Low | Low | High | Low |
| Nilsson, B. B., 2008 (31) | Unclear | Low | Unclear | Low | Low | Unclear | Low |
| Passino, C., 2008 (32) | Low | Unclear | Unclear | Low | Low | High | Low |
| Brubaker, Peter H., 2009 (33) | Unclear | Unclear | Unclear | Low | Low | Low | Low |

**Table S1** (*continued*)


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**Table S1** (*continued*)

| Author, year | Random sequence generation (selection bias) | Allocation concealment (selection bias) | Blinding of participants and personnel (performance bias) | Blinding of outcome assessment (detection bias) | Incomplete outcome data (attrition bias) | Selective reporting (reporting bias) | Other bias |
|---|---|---|---|---|---|---|---|
| Jolly, K., 2009 (34) | Low | Unclear | Unclear | Low | Low | Low | Low |
| Malfatto, G., 2009 (35) | High | Low | High | Low | Unclear | Low | Low |
| Mandic, Sandra, 2009 (36) | Unclear | Unclear | Unclear | Low | High | Low | Low |
| Munk, Peter S., 2009 (37) | Unclear | Unclear | Low | Unclear | Low | Low | Low |
| Winkelmann, Eliane R., 2009 (38) | High | Unclear | Unclear | Low | Unclear | Low | Low |
| Davidson, Patricia M., 2010 (39) | High | Unclear | Low | Low | Low | Low | Low |
| Erbs, S., 2010 (40) | Low | Low | Unclear | Low | Low | Low | Low |
| Jakovljevic, Djordje G., 2010 (41) | High | Unclear | Low | Low | Unclear | High | Low |
| Kitzman, Dalane W., 2010 (42) | Unclear | Unclear | Unclear | Low | Low | Low | Low |
| Lima, Márcia M. O., 2010 (43) | Unclear | Unclear | High | Low | Low | Low | Low |
| Nilsson, Birgitta Blakstad, 2010 (44) | Unclear | Low | Unclear | Low | Low | Unclear | Low |
| Anagnostakou, V, 2011 (45) | Unclear | High | Low | Unclear | Low | High | Low |
| Bouchla, A, 2011 (46) | Unclear | Unclear | Low | Low | Low | Low | Low |
| Chien, C. L., 2011 (47) | High | Low | Unclear | Low | High | Low | Low |
| Edelmann, F., 2011 (48) | High | Unclear | Low | Low | Low | Low | Low |
| Maiorana, Andrew J., 2011 (49) | Unclear | Low | Low | Low | Unclear | Low | Low |
| Belardinelli, R, 2012 (50) | Low | Unclear | Low | Unclear | Low | Low | Low |
| Freyssin, C., 2012 (51) | Low | Low | Low | Unclear | Low | Low | Low |
| Myers, Jonathan, 2012 (52) | Unclear | Unclear | Low | Low | High | Low | Low |
| Sandri, M, 2012 (53) | High | Unclear | Unclear | Low | High | Low | Low |
| Servantes, D. M., 2012 (54) | Low | Unclear | Low | Low | Low | Low | Low |
| Smart, NA, 2012 (55) | High | Low | Unclear | Low | Low | Low | Low |
| Smart, Neil., 2012 (56) | Low | Unclear | Unclear | Low | Low | Low | Low |
| Eleuteri, E., 2013 (57) | Unclear | Unclear | Unclear | Low | Low | Low | Low |
| Fu, Tieh-Cheng, 2013 (58) | Low | Low | Low | Low | Unclear | Low | Low |
| Iellamo, F, 2013 (59) | Low | Low | Low | Low | Low | Low | Low |
| Kitzman, DW, 2013 (60) | Low | Unclear | Low | Unclear | Low | Low | Low |
| Laoutaris, ID, 2013 (61) | Unclear | Low | Low | Low | Unclear | Low | Low |
| Mehani, S. H., 2013 (62) | Low | Low | Low | Low | High | Low | Low |
| Mezzani, A., 2013 (63) | Low | Unclear | Unclear | Low | High | Low | Low |
| Adamopoulos, S, 2014 (64) | High | Unclear | Unclear | Low | Low | Low | Low |
| Antunes-Correa, L. M., 2014 (65) | Unclear | Unclear | Unclear | Low | Low | Low | Low |
| Chrysohoou, C, 2014 (66) | Low | Unclear | Unclear | Low | Low | Low | Low |

**Table S1** (*continued*)


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**Table S1** (*continued*)

| Author, year | Random sequence generation (selection bias) | Allocation concealment (selection bias) | Blinding of participants and personnel (performance bias) | Blinding of outcome assessment (detection bias) | Incomplete outcome data (attrition bias) | Selective reporting (reporting bias) | Other bias |
|---|---|---|---|---|---|---|---|
| de Meirelles, LR, 2014 (67) | Unclear | Unclear | Unclear | Low | Unclear | Low | Low |
| Georgantas, A, 2014 (68) | Unclear | Unclear | High | Low | Low | Low | Low |
| Koufaki, P., 2014 (69) | Unclear | Unclear | Unclear | Low | Low | Low | Low |
| Palau, P, 2014 (70) | Unclear | Unclear | Low | Low | High | Unclear | Low |
| Angadi, S. S., 2015 (71) | Unclear | Low | Low | Low | Low | Low | Low |
| Benda, NM, 2015 (72) | Unclear | Low | Low | Low | High | Low | Low |
| Groehs, R. V., 2015 (73) | Unclear | Unclear | Low | Low | Low | Low | Low |
| Kim, C., 2015 (74) | Low | Unclear | High | Low | Low | Unclear | Low |
| Nolte, K, 2015 (75) | Low | Low | Low | Low | Low | Low | Low |
| Piotrowicz, E., 2015 (76) | High | Unclear | High | Low | Unclear | Low | Low |
| Smolis-Bąk, E., 2015 (77) | Low | Unclear | Unclear | Low | Low | Low | Low |
| Stevens, A. L., 2015 (78) | Low | Low | Low | Low | Low | Low | Low |
| Yaylalı, YT, 2015 (79) | High | Unclear | Unclear | Low | Low | Low | Low |
| Acanfora, D, 2016 (80) | Unclear | Unclear | Low | Low | Low | Low | Low |
| Antonicelli, R, 2016 (81) | Unclear | Low | Unclear | Low | Unclear | Low | Low |
| Höllriegel, R, 2016 (82) | High | Unclear | Unclear | Low | High | Low | Low |
| Kitzman, D. W., 2016 (83) | Low | Unclear | Unclear | Low | Low | Unclear | Low |
| Safiyari-Hafizi, H, 2016 (84) | High | Unclear | Low | Low | Low | Low | Low |
| Ellingsen, Ø, 2017 (85) | Unclear | Low | Low | Low | Low | Low | Low |
| Hwang, R., 2017 (86) | Unclear | Unclear | Unclear | Low | Low | Low | Low |
| Maldonado-Martín, S., 2017 (87) | Unclear | Low | Unclear | Low | Low | Low | Low |
| Villelabeitia Jaureguizar, K., 2017 (88) | Low | Unclear | Unclear | Low | Low | Low | Low |
| Chen, DM, 2018 (89) | Unclear | Low | Low | Low | Low | Low | Low |
| Chen, YW, 2018 (90) | Unclear | Low | High | Low | Low | Low | Low |
| Doletsky, A, 2018 (91) | Unclear | Low | Low | Low | Unclear | Low | Low |
| Munch, GW, 2018 (92) | Unclear | Low | Low | Low | High | High | Low |
| Peng, X., 2018 (93) | Unclear | Low | Unclear | Low | Low | Low | Low |
| Servantes, DM, 2018 (94) | Low | Unclear | Unclear | Low | Low | Low | Low |
| Tanaka, Y, 2018 (95) | Low | Unclear | Low | Low | Unclear | Low | Low |
| Besnier, F, 2019 (96) | Low | Unclear | Unclear | Low | Low | Low | Low |
| Chou, CH, 2019 (97) | Low | Low | Unclear | Low | High | Low | Low |
| Prince, SA, 2019 (98) | Unclear | Low | Low | Low | Low | Unclear | Low |
| Schertz, A, 2019 (99) | High | Low | Low | Unclear | Unclear | Low | Low |

**Table S1** (*continued*)


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**Table S1** (*continued*)

| Author, year | Random sequence generation (selection bias) | Allocation concealment (selection bias) | Blinding of participants and personnel (performance bias) | Blinding of outcome assessment (detection bias) | Incomplete outcome data (attrition bias) | Selective reporting (reporting bias) | Other bias |
|---|---|---|---|---|---|---|---|
| Donelli da Silveira, A, 2020 (100) | Unclear | Low | Unclear | Low | Low | Low | Low |
| Lan, NSR, 2020 (101) | Unclear | Unclear | Unclear | Low | Low | Low | Low |
| Turri-Silva, N, 2021 (102) | Low | Unclear | Unclear | Low | High | Low | Low |
| Austin, J.k, 2005 (103) | Unclear | Unclear | Unclear | Unclear | Low | Low | Low |
| Roveda, F., 2003 (104) | Unclear | Low | Unclear | Low | Low | Low | Low |
| Linke, Axel, 2015 (105) | Unclear | Low | Unclear | Low | Low | Low | Low |
| Laoutaris, Ioannis D., 2007 (106) | Low | Unclear | Low | Low | Low | Low | Low |
| Roditis, Petros, 2007 (107) | Low | Unclear | Low | Low | Low | Low | Low |
| Babu, A. S., 2011 (108) | High | Unclear | Low | Low | Low | Low | Low |
| Caminiti, G, 2011 (109) | Low | Low | Low | Low | Low | Low | Low |
| Gary, R. A., 2011 (110) | Unclear | Unclear | Low | Low | Low | Low | Low |
| Haykowsky, M. J., 2012 (111) | Unclear | Unclear | Low | Low | High | Low | Low |
| Norman, J. F., 2012 (112) | Unclear | Unclear | Unclear | Low | Low | Low | Low |
| Fayazi, S., 2013 (113) | Unclear | Unclear | Low | Low | Low | Low | Low |
| Iellamo, Ferdinando, 2013 (114) | Unclear | Low | Unclear | Low | Unclear | Low | Low |
| Hassanpour Dehkordi, A., 2015 (115) | Unclear | Low | Unclear | Low | Unclear | Low | Low |
| Banks, AZ, 2016 (116) | Low | Unclear | Low | Low | High | Low | Low |
| Tzanis, G., 2017 (117) | Unclear | Low | Low | Low | Unclear | Low | Low |
| Iliou, MC, 2018 (118) | Low | Unclear | Low | Low | Low | Low | Low |
| Oliveira, MF, 2018 (119) | Low | Unclear | Low | Low | Unclear | Low | Low |
| Dalal, HM, 2019 (120) | Unclear | Low | Unclear | Low | Low | Low | Low |
| Palau, P, 2019 (121) | Unclear | Low | Unclear | Low | Low | Low | Low |
| Yeh, GY, 2011 (122) | Unclear | Unclear | Unclear | Unclear | Low | Low | Low |


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**Table S2** Study and training characteristics

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| Hambrecht, R., 2000 (1) | G1: Exercise Training Group (During the first 2 weeks, patients exercised 4 to 6 times daily for 10 minutes using a bicycle ergometer. Patients were asked to exercise close to their target heart rate daily for 20 minutes every day for 6 months. In addition, they were expected to participate in at least 1 group training session of 60 minutes each week) (n=31) G2: Control Group (n=33) | Aerobic training | Bicycle | 42 |
| Oka, R. K., 2000 (2) | G1: Exercise (walking at home 3 days/week at an intensity and duration that gradually increased over the initial 2 to 3 weeks to approximately 70% of peak heart rate for a duration of 40 to 60 minutes) (n=12)<br>G2: Usual Care (n=12) | Aerobic training | Bicycle | 21 |
| Pu, C. T., 2001 (3) | G1: Resistance Training Group (high-intensity PRT 3 days/wk for 10 wk;Training sessions averaged 60 min and were preceded by 2 min of walking or cycling for warm-up and ended with 5 min of stretching. Subjects performed three sets of eight repetitions on each machine before moving on to the next. Each repetition lasted 6–9 s with a 2 to 3-s rest between repetitions and a 60- to 90-s rest between sets) (n=9)<br>G2: Placebo Control Group (2 days/week in supervised, low-intensity stretching exercises) (n=7) | Strength training | ST | 10 |
| Willenheimer, R., 2001 (4) | G1: training group (The patients carried out cycle ergome-ter interval training at a heart rate corresponding to 80% of peak-$VO_2$ 65beats /min, for as long as possible during each interval. The exercise time was gradually increased from 15 min twice a week to 45 min three times a week from week 7, for a total of 16 weeks) (n=17)<br>G2: control group (n=20) | HIIT | HIIT | 16 |
| Parnell, M. M., 2002 (5) | G1: Exercise group (The exercise programme was conducted over 8 weeks; patients were required to exercise at 50–60% of maximum heart rate, and to progressively increase their exercise duration from three 30 min sessions per week to approx. 60 min per day on 5–7 days per week) (n=11)<br>G2: Control group (n=10) | Aerobic training | CAT | 8 |
| Giannuzzi, P., 2003 (6) | G1: Exercise Training Group (The exercise protocol consisted of supervised continuous sessions of 30-minute bicycle ergometry ≥3 times a week (3 to 5 times) at 60% of the peak $VO_2$ achieved at the initial symptom-limited exercise testing) (n=45)<br>G2: Control Group (educational support but no formal exercise protocol) (n=44) | Aerobic training | Bicycle | 42 |
| Gielen, Stephan, 2003 (7) | G1: training group (During the first two weeks, patients exercised four to six times daily for 10 min on a bicycle ergometer. Workloads were adjusted so that 70% of the symptom-limited maximal oxygen uptake was reached) (n=10)<br>G2: control group (continued their sedentary lifestyle and remained on their individually tailored cardiac medication supervised by their private physicians) (n=10) | Aerobic training | Bicycle | 42 |
| Pozehl, Bunny, 2003 (8) | G1: exercise group (The exercise training intervention consisted of 3 days per week over 12 weeks (36 sessions) and was delivered according to study protocol by the cardiac rehabilitation department associated with the hospital. Each exercise session lasted 50 minutes (5-minute warm-up phase, 20-minute aerobic phase, 20 minutes of strength/ resistance training, 5-minute cool-down phase) (n=16)<br>G2: control group (n=7) | Combine training | AT+ST | 12 |
| Corvera-Tindel, T., 2004 (9) | G1: progressive home walking exercise program (Home walking exercise was once a day, 5 days per week, with an exercise duration and intensity initiated at 10 minutes and 40% maximal heart rate (HR) and progressively increased up to 60 minutes and 65% maximal HR in the last 6 weeks of the program, respectively) (n=42)<br>G2: "usual activity" control group (maintain their normal daily activities) (n=37) | Aerobic training | Walking | 12 |
| Koukouvou, Georgia, 2004 (10) | G1: rehabilitation group (after initial (2–4 weeks) institution-based training, all patients were exercised in subgroups. Each subgroup comprised 5 patients, and each exercise session consisted of various upper and lower body training modalities including stationary cycling, walking or jogging, calisthenics, stair climber and step-aerobic exercises. After the first 3 months of aerobic training, some resistance exercises with therabands and small weights (1 kg) for major muscle groups were added to the training prescription. They were exercised at 50–70% of peak $VO_2$ or RPE between 12 and<br>14, for 60 min (plus 5 min per month), 3–4 times weekly) (n=16)<br>G2: control group (n=10) | Combine training | AT+ST | 42 |

**Table S2** (*continued*)


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**Table S2** (*continued*)

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| Sabelis, L. W., 2004 (11) | G1: training group (combined strength and endurance exercises; four sessions/week: two sessions supervised and two sessions at home) (n=16)<br>G2: control group (n=13) | Combine training | AT+ST | 26 |
| van den Berg-Emons, Rita, 2004 (12) | G1: training group (3-month aerobic program above standard treatment. Training was performed twice a week for 1 h. Training activities were predominantly aerobic and comprised cycling, walking and games) (n=18)<br>G2: control group (standard treatment without special advice for exercise) (n=16) | Aerobic training | CAT | 21 |
| Yeh, Gloria Y., 2004 (13) | G1: tai chi training group (a 1-hour class held twice weekly) (n=15)<br>G2: usual care group (pharmacologic therapy and dietary and exercise counseling) (n=15) | Aerobic training | OAT | 12 |
| Senden, P. Jeff, 2005 (14) | G1: training group (combined strength and endurance exercises; four times per week, twice supervised and twice at home) (n=25)<br>G2: control group (n=36) | Combine training | AT+ST | 26 |
| Belardinelli, R., 2006 (15) | G1: Exercise group (supervised exercise training program at 60% of peak $VO_2$ three times a week for 8 weeks) (n=30)<br>G2: Control group (usual-care) (n=22) | Aerobic training | Bicycle | 56 |
| Dall'Ago, Pedro, 2006 (16) | G1: P-IMT Group (placebo-inspiratory muscle training) (n=16)<br>G2: IMT Group (Patients received either IMT or P-IMT for 30 min 7 times per week, for 12 weeks using the Threshold Inspiratory Muscle Training device. During training, patients were instructed to maintain diaphragmatic breathing, with a breathing rate at 15 to 20 breaths/min. For the IMT group, inspiratory load was set at 30% of maximal static inspiratory pressure, and weekly training loads were adjusted to maintain 30% of the PImax. The P-IMT followed the same schedule, but with no inspiratory load. Each week, six training sessions were performed at home and one training session was supervised at the hospital) (n=16) | IMT | IMT | 12 |
| de Mello Franco, F. G., 2006 (17) | G1: exercise trained group (The exercise trained group underwent 4 months of supervised exercise training. This phase consisted of three 60-min exercise sessions/week. Each session consisted of a 5-min warm-up period, 25 to 40 min of aerobic exercise on a cycle ergometer, 10 min of local strengthening exercises, and a 5-min cool-down period) (n=17)<br>G2: untrained control group (n=12) | Combine training | AT+ST | 28 |
| Dimopoulos, Stavros, 2006 (18) | G1: continuous training group (All patients underwent exercise endurance training on electro-magnetically braked cycle ergometers three times per week, for a total of 36 sessions. Patients assigned to continuous training, exercised at intensity, which was initially 50% of baseline WRp for 40 min per day) (n=14)<br>G2: interval training group (patients assigned to interval training, exercised at a 100% of baseline WRp, alternating 30 s of exercise with 30 s of rest, for the same duration) (n=10) | Aerobic training/HIIT | Bicycle/HIIT | 12 |
| Jónsdóttir, Sólrún, 2006 (19) | G1: Control group (n=22)<br>G2: Training group (outpatient supervised physical training twice a week for five months. Each session started with a 10 min warm-up period, either sitting or standing. It consisted of breathing exercises and free non-resistance arm and leg movements. This was followed by 15 min of pedaling on a bicycle and 20 min of circuit resistance training. Each session ended with a cool down for 5 min with stretching of the engaged muscle groups) (n=21) | Combine training | AT+ST | 36 |
| Maria Sarullo, Filippo, 2006 (20) | G1: Training group (supervised physical training programme using a bicycle ergometer for 30min three times a week at a load corresponding to 60–70% of their oxygen consumption ($VO_2$) peak) (n=30)<br>G2: Control group (inspiratory muscle training) (n=30) | Aerobic training | Bicycle | 21 |
| Passino, Claudio, 2006 (21) | G1: Group T (a nine-month training program at 60% of the maximal oxygen uptake) (n=44)<br>G2: Group C (no training) (n=41) | Aerobic training | Bicycle | 63 |
| Dracup, K., 2007 (22) | G1: control group (n=87)<br>G2: exercise group (Aerobic training was initially 10 minutes at 40% maximal heart rate and progressively increased up to 45 minutes at 60% maximal heart rate for the remainder of the program. Resistance training was prescribed at 80% of one repetition maximum, which is the maximal weight lifted one time, for 2 sets of10 repetitions using seated biceps curls to strengthen the arms and seated lateral raises to strengthen shoulders) (n=86) | Combine training | AT+ST | 42 |

**Table S2** (*continued*)


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**Table S2** (*continued*)

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| Feiereisen, P., 2007 (23) | G1: ST group (exclusive strength training) (n=15)<br>G2: ET group (conventional endurance training) (n=15)<br>G3: CT group (combined ET–ST training) (n=15)<br>G4: Control group (n=15) | Strenth training/ Aerobic training/ Combine training | ST/Bicycle/AT+ST | 13 |
| Klecha, Artur, 2007 (24) | G1: trained group (Patients trained three times a week for 6 months. of the predicted heart rate at $VO_2$peak achieved at baseline. Sixty-minute sessions were divided into three parts: 20 min warming up, 25 min training on a cycloergometer and 15 min relaxation exercises) (n=25)<br>G2: untrained group (n=25) | Aerobic training | Bicycle | 42 |
| Mueller, Lionel, 2007 (25) | G1: exercise group (Five indoor cycling sessions were performed weekly for a duration of 30 min, and all subjects walked outdoors for 45 min twice daily. Training duration was one month) (n=14)<br>G2: control group (n=13) | Aerobic training | CAT | 7 |
| Myers, J., 2007 (26) | G1: Exercise group (Two outdoor walking sessions daily for a duration of approximately 1 hour were performed, once in the morning and once in the afternoon. The patients performed four 45-minute periods of monitored stationary cycling per week. The cycling sessions were designed to elicit an intensity of roughly 60% to 80% of the patient's heart rate reserve and were increased progressively as tolerated) (n=12)<br>G2: Control group (n=12) | Aerobic training | CAT | 14 |
| Wisløff, Ulrik, 2007 (27) | G1: control group that received standard advice regarding physical activity (n=9)<br>G2: moderate continuous<br>training (70% of highest measured heart rate, ie, peak heart rate) (n=8)<br>G3: aerobic interval training (95% of peak heart rate) 3 times per week for 12 weeks (n=9) | Aerobic training/HIIT | Walking/HIIT | 12 |
| Beckers, Paul J., 2008 (28) | G1: Combined endurance-resistance training group (During the first 2 months, patients assigned to the CT group trained for almost 40 min on the Fitness equipment (Unica, Technogym, Gambetola, Italy), whereas only 10 min were spent on ET. The next 2 months, resistance training was reduced to 30 min (nine muscle groups, two times 15 repetitions each) and ET was increased to two times 8 min. During the last 2 months, ET was progressively introduced and very soon exercise times of 10, 12, and 15 min were achieved on three devices) (n=28)<br>G2: Endurance training group (The ET group (*Figure 2*) trained for 8 min on five different training devices (treadmill, bicycle, stair or step, arm-cycling, half recumbent, or reclined cycling). When changing from one device to another, 2 min of recuperation time was introduced. After 4 months, training time per device was increased to 15 min (three devices) (n=30) | Combine training/ aerobic training | AT+ST/CAT | 42 |
| Beer, M., 2008 (29) | G1: Exercise Group (Five sessions/week for a duration of 45 min were performed. Warm-up and cool-down periods preceded and followed each exercise session) (n=11)<br>G2: Control Group (n=11) | Aerobic training | Bicycle | 14 |
| Giallauria, Francesco, 2008 (30) | G1: Group T (a 6 month exercise-based Cardiac Rehabilitation programme) (n=30)<br>G2: Group C (maintain physical activity and a correct lifestyle) (n=31) | Aerobic training | Bicycle | 42 |
| Nilsson, B. B., 2008 (31) | G1: Rehabilitation Group: The exercise program consisted of group-based simple aerobic dance movements (with music) 2 days a week for 4 months. Each session lasted 50 minutes (including warm-up and cool-down), followed by 15 to 30 minutes counseling (n=40)<br>G2: Control Group (n=40) | Aerobic training | CAT | 28 |
| Passino, C., 2008 (32) | G1: home-based aerobic exercise-training program group (the training program consisted of cycling on a bike at 65% of peak $VO_2$ for a minimum of 3 days/ week, 30 min/day; the exercise load was adjusted after 3 months by repeating a cardiopulmonary test, to achieve a progressive training effect) (n=71)<br>G2: control group (n=19) | Aerobic training | Bicycle | 63 |
| Brubaker, Peter H., 2009 (33) | G1: exercise training group (Sixteen-week supervised ET program of endurance exercise (walking and stationary cycling) three times per week for 30 to 40 minutes at moderate intensity regulated according to heart rate and perceived exertion) (n=30)<br>G2: usual care control group (n=29) | Aerobic training | CAT | 16 |

**Table S2** (*continued*)


https://dx.doi.org/10.21037/cdt-2024-698

**Table S2** (*continued*)

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| Jolly, K., 2009 (34) | G1: exercise group (a home-based walking and resistance exercise programme plus specialist nurse care: The home exercise programme was based on current recommendations for exercise training in heart failure, 12 consisting of both aerobic and resistance elements. The aerobic component was based on progressive walking with self-completion exercise logs. Walking time was measured and progressed during the supervised sessions in the initial 2 weeks and progressed gradually thereafter using the Borg breathlessness scale and aiming for a score of 3 (moderately breathless). The aim of the programme was to ultimately achieve continuous bouts of exercise (20–30 min) five times a week after 6 months of the home programme) (n=77)<br>G2: usual care group (specialist nurse care alone) (n=80) | Combine training | AT+ST | 84 |
| Malfatto, G., 2009 (35) | G1: training group (Each session lasted 1 hour, beginning with a 15- to 20-minutewarm-up phase of stretching, followed by 40 minutes of bicycle or treadmill exercise during constant ECG telemonitoring and cardiologic supervision) (n=27)<br>G2: control group (n=27) | Aerobic training | CAT | 21 |
| Mandic, Sandra, 2009 (36) | G1: Aerobic training (Participants exercised three times per week for 12 weeks. The aerobic training group performed lower limb exercise on a treadmill (15 minutes) and a cycle ergometer (15 minutes) at a moderate intensity (50–70% of heart rate reserve; Borg Scale 11–14/20)) (n=9)<br>G2: Combined aerobic and resistance training (The combined aerobic and resistance training group used similar aerobic exercise prescription with a treadmill and a Schwinn Airdyne to exercise both the upper and lower limbs. In addition, this group performed six resistance exercises (chest press, shoulder press, vertical row, bicep curl, triceps extension and leg extension) using commercially available weight machines. Patients performed 1–2 sets of 10–15 repetitions of each exercise at 50–70% of one-repetition maximum) (n=11)<br>G3: Usual care (continued with their usual activities of daily living) (n=13) | Aerobic training/ Combine training | CAT/AT+ST | 12 |
| Munk, Peter S., 2009 (37) | G1: control group (n=20)<br>G2: training group (The patients trained in groups of 10, starting 11 ± 4 days after PCI, 3 times a week for 1 hour. The training model included 10 minutes of warm-up at 60% to 70% of maximal heart rate, followed by 4-minute intervals at 80% to 90% of maximal heart rate, when patients were riding an ergometric bicycle or were running. Intervals were interrupted by 3 minutes of active recovery at 60% to 70% of maximal heart rate. Afterwards, there was 5 minutes of cool-down, 10 minutes of abdominal and spine resistance exercises, and 5 minutes of stretching and relaxing) (n=20) | HIIT | HIIT | 42 |
| Winkelmann, Eliane R., 2009 (38) | G1: aerobic exercise training (All patients were enrolled in a supervised exercise program performed 3 times per week, for 12 weeks, to complete a total of 36 sessions. Each session included a 5-minute period of warm-up with no resistance, followed by a period exercising at the target heart rate that corresponded to the first ventilatory threshold on the cardiopulmonary exercise test) (n=12)<br>G2: aerobic exercise training plus inspiratory muscle training (Patients randomized to AE + IMT used the Threshold Inspiratory Muscle Training device for 30 minutes, 7 times per week, with an inspiratory load at 30% of PImax, as previously described.2 Every week, training loads were adjusted to maintain 30% of the PImax, and patients performed 6 training sessions at home and 1 training session was supervised at the hospital) (n=12) | Aerobic training/ Combine training | Bicycle/AT+IMT | 12 |
| Davidson, Patricia M., 2010 (39) | G1: Intervention (each exercise session started with 5–10 min of warm-up and ended with 5–10 min of cool-down activities, consisting of callisthenics and static stretching. The warm-up was followed by a 30-min endurance (exercise) phase. Each session also included a period of resistive training with low resistance and high repetitions) (n=50)<br>G2: Control (n=44) | Combine training | AT+ST | 12 |
| Erbs, S., 2010 (40) | G1: training group (During the first 3 weeks, patients exercised 3 to 6 times daily for 5 to 20 minutes on a bicycle ergometer adjusted to the work load at which 50% of maximum oxygen uptake ($VO_2$max) was reached. On discharge, patients were provided with bicycle ergometers for home exercise training. They were encouraged to exercise close to their target heart rate daily for 20 to 30 minutes for a period of 12 weeks and were expected to participate in 1 supervised group training session for 60 minutes) (n=18)<br>G2: control group (continued their sedentary lifestyle) (n=19) | Aerobic training | Bicycle | 12 |

**Table S2** (*continued*)


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**Table S2** (*continued*)

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| Jakovljevic, Djordje G., 2010 (41) | G1: Aerobic group (Both aerobic and resistance training programmes consisted of five sessions per week for a period of 12 weeks. One session per week was a supervised and the four remaining exercise sessions were performed at home. Patients were encouraged to exercise between 60–80% of peak oxygen consumption, with a rating of perceived exertion set between 11 and 13) (n=11)<br>G2: Resistance group (n=10) | Aerobic training/ Strength training | CAT/ST | 12 |
| Kitzman, Dalane W., 2010 (42) | G1: Exercise (exercise 3 times per week for 16 weeks for a total of 48 total sessions in a dedicated facility under medical supervision (14;36). Each session lasted one hour and consisted of warm-up, stimulus, and cool-down phases) (n=24)<br>G2: Control (n=22) | Aerobic training | CAT | 16 |
| Lima, Márcia M. O., 2010 (43) | G1: inactive control group (n=19)<br>G2: exercise training group (Exercise prescription consisted of a 15 min warm-up, walking for up to 30 min, followed by a 15 min cooling-down period. The exercise intensity during the first 2 weeks corresponded to 55% at 65% of the HR peak reached at the baseline exercise test) (n=18) | Aerobic training | Walking | 12 |
| Nilsson, Birgitta Blakstad, 2010 (44) | G1: Exercise group (the program consisted of group-based simple aerobic exercises, including three intervals of high intensity (15–18 on the Borg scale). The total duration of the exercise program was 50 minutes) (n=39)<br>G2: Control group (n=39) | HIIT | HIIT | 28 |
| Anagnostakou, V, 2011 (45) | G1: interval cycle training (a training program lasting for 40 minutes) (n=14)<br>G2: a program that included 20 minutes of interval cycle exercise and 20 minutes of strength training (n=14) | HIIT/Combine training | HIIT/AT+ST | 12 |
| Bouchla, A, 2011 (46) | G1: aerobic training (40 minutes;3 sessions per week, for 12 weeks) (n=10)<br>G2: combined aerobic plus strength training group (20 minutes of aerobic exercise plus 20 minutes of strength training;3 sessions per week, for 12 weeks) (n=10) | Aerobic training/ Combine training | Bicycle/AT+ST | 12 |
| Chien, C. L., 2011 (47) | G1: exercise group (an individualised home-based exercise program, 30 minutes per session, 3 sessions per week for 8 weeks, with regular telephone follow-up and consultations) (n=22)<br>G2: control group (usual activity) (n=22) | Combine training | AT+ST | 8 |
| Edelmann, F., 2011 (48) | G1: exercise group (supervised endurance/resistance training in addition to usual care: Patients randomized to ET participated in a supervised, facilitybased training program consisting of endurance and resistance training (32 sessions). During weeks 1 through 4, aerobic endurance training (cycling 2×/week) of increasing intensity and duration (from 20 to 40 min) was performed. Training intensity was tailored individually to a target heart rate of 50% to 60% of peak oxygen uptake (peak $VO_2$) during baseline spiroergometry. From week 5 onward, weekly training frequencies were increased (3×/ week) and workload was increased to a target heart rate of 70% of baseline peak $VO_2$. Also starting at the fifth week, resistance training (bench press, leg press, leg curl, rowing machine, triceps dip, latissimus pull down) was added twice per week. Resistance training was performed for 15 repetitions per exercise per session at a workload corresponding to 60% to 65% of the 1 repetition maximum measured at the end of week 4) (n=41)<br>G2: control group (usual care alone) (n=19) | Combine training | AT+ST | 21 |
| Maiorana, Andrew J., 2011 (49) | G1: untrained control group(n=12)<br>G2: aerobic training (AT commenced at 50% to 60% of baseline $VO_2$ peak and progressed to 60% to 70% of the $VO_2$ peak after 6 weeks, so that the relative intensity was consistent with the RT group) (n=12)<br>G3: resistance training (3 sets of 9 exercises, with a 3-minute rest period between each set, for a total of 46.5 minutes per session) (n=12) | Aerobic training/ Strenth training | CAT/ST | 12 |
| Belardinelli, R, 2012 (50) | G1: Standard care (n=60)<br>G2: exercise training (The training program consisted of 3 sessions per week at the hospital for 2 months, then 2 supervised sessions the rest of the year. The intensity was chosen at 60% of peak $VO_2$ for the first 2 months, and thereafter at 70% of peak $VO_2$ for the following months until the end of the study. Trained patients were encouraged to exercise without supervision at home at least a third time, perform-ing aerobic activities at the same heart rate as the other 2 supervised sessions. Each session lasted approximately 1 h, beginning with a warm-up phase of calisthenics and stretching for 15 to 20 min, followed by 40 min of aerobic activity on a cycle ergometer, a treadmill, or both) (n=63) | Aerobic training | CAT | 14 |

**Table S2** (*continued*)


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**Table S2** (*continued*)

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| Freyssin, C., 2012 (51) | G1: Aerobic continuous training (Half of the CT was performed on a treadmill and half on a cycle ergometer (for practical and organizational reasons). CT was composed of a 10-minute warm-up followed by 45 minutes of aerobic exercise corresponding to the heart rate at the VT1 and a final 5 minutes of active recovery. Patients in the CT group practiced 360 minutes of exercise weekly) (N=14)<br>G2: High intensity interval (After a 10-minute warm-up phase at 5W, IT consisted of 12 repetitions of 30 seconds of cycling exercise, followed by 60 seconds of complete rest. The exercise intensity was 50% and 80% of the maximal power reached during a steep ramp test during the first 4 weeks and the last 4 weeks, respectively. Each training session consisted of 3 series (12 repetitions of 30s of exercise), separated by 5 minutes of rest. Patients in the IT group practiced 168 minutes of exercise weekly) (N=12) | Aerobic training/HIIT | Bicycle/HIIT | 8 |
| Myers, Jonathan, 2012 (52) | G1: Standard care (N=26)<br>G2: High intensity interval (Program components included education, exercise, and low-fat meals prepared 3 times daily by facility cook. Two outdoor walking sessions daily for a duration of approximately 1 hour were performed, once in the morning and once in the afternoon. In addition to these walking periods, subjects performed four 45-min periods of monitored stationary cycling per week. The cycling sessions were designed to elicit an intensity of roughly 60% to 80% of the heart rate reserve and were increased progressively as tolerated) (N=24) | HIIT | HIIT | 14 |
| Sandri, M, 2012 (53) | G1: Standard care (N=15)<br>G2: Aerobic training (The exercise intervention consisted of four supervised training sessions per weekday each for 20 min (excluding 5 min of warming-up and cooling-down) using a bicycle ergometer interrupted by recreation intervals of at least 60 min after each session. Workloads were adjusted to heart rate so that 70% of the symptom-limited maximum oxygen uptake was reached) (N=15) | Aerobic training | Bicycle | 4 |
| Servantes, D. M., 2012 (54) | G1: Aerobic training (The aerobic protocol consisted of a warm-up (strengthening exercises, 10 minutes), walking in the street or parks (30 minutes in the first month and up to 45 minutes in the last two months) and cool-down (strengthening exercises, 10 minutes). (N=17)<br>G2: Aerobic training+strength training (The strength training was added for Group 2.<br>It consisted of three exercises for upper limbs and four exercises for lower limbs, attending the major muscle groups, with graduated free weights. The intensity was determined by 30–40% of one-repetition maximum for elbow and knee extension/flexion. In the first month one series of 12 repetitions was performed with<br>a one-minute rest period. Exercise progression was either by increasing resistance (heavier free weight) or the number of repetitions: 14 repetitions in the second month and 16 repetitions in the third month, for all exercises) (N=11)<br>G3: Standard care(N=17) | Aerobic training/ Combine training | Walking/AT+ST | 21 |
| Smart, NA, 2012 (55) | G1: Standard care(n=14)<br>G2: exercise treaning (All ExT patients undertook 16 weeks of supervised, outpatient, cycle ergometer ExT at 60 RPM, at a frequency of three 30-minute sessions per week, and at a workload corresponding to a heart rate equivalent to an initial intensity of 60% to 70% peak oxygen consumption from the metabolic exercise test. Exercise intensity was uptitrated by 2 to 5 Watts/wk, provided that patients were tolerating the cycle training) (n=16) | Aerobic training | Bicycle | 16 |
| Smart, Neil., 2012 (56) | G1: Aerobic continuous training (All patients undertook 16 weeks of supervised cycle ergometer exercise training at 60 RPM, at a frequency of three 30-minute CON or 60-minute INT sessions per week, and at a workload corresponding to an initial intensity of 60% to 70% peak $VO_2$ from the cardiopulmonary exercise test. These groups completed 16 weeks of stationary cycling at 70% peak $VO_2$, thrice weekly for 30-minute CON or 60-minute (60 seconds of work: 60 seconds of rest) INT sessions; both groups completed the same absolute volume of work. Exercise intensity was uptitrated by 2 to 5 W/week, provided that patients were tolerating the cycle training) (N=13)<br>G2: High intensity interval(N=10) | Aerobic training/HIIT | Bicycle/HIIT | 16 |
| Eleuteri, E., 2013 (57) | G1: control (n=10)<br>G2: aerobic training (5 sessions a week of 30-min cycle ergometry (60 rev/min) at a power and heart rate corresponding to VAT, preceded and followed by a 5-min warm-up and cool-down unloaded period, respectively) (n=11) | Aerobic training | Bicycle | 14 |

**Table S2** (*continued*)


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**Table S2** (*continued*)

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| Fu, Tieh-Cheng, 2013 (58) | G1: Standard care(N=15)<br>G2: Aerobic continuous training (The exercise protocol in the MCT group comprised a warm-up at 30% of $VO_2$peak for 3 min, followed by continuous 60% of $VO_2$peak (≈60% HRR) for 30 min, then a cool-down at 30% of $VO_2$peak for 3 min) (N=15)<br>G3: High intensity interval (AIT group warmed up for 3 min at 30% of $VO_2$peak [≈30% heart rate reserve (HRR); ≈30%·(HRpeak–HRrest)+HRrest] before exercise five 3-minute intervals at 80% of $VO_2$peak (≈80% HRR). Each interval was separated by 3-minute exercise at 40% of $VO_2$peak (≈40% HRR). The exercise session was terminated by 3-minute cool-down at 30% of $VO_2$peak) (N=15) | Aerobic training/HIIT | Bicycle/HIIT | 12 |
| Iellamo, F, 2013 (59) | G1: Aerobic continuous training (walked continuously at a moderate training intensity, ~45–60% of HRR for 30–45 min, according to the training periodization) (n=8)<br>G2: Aerobic interval training (warmed-up for 9 minutes with calisthenics and stretching exercise, before walking four 4-minutes intervals by 2–4 times at ~75~80% of HRR, with active pauses of 3 min of walking at 45–50% of HRR) (n=8) | Aerobic training/HIIT | Walking/HIIT | 12 |
| Kitzman, DW, 2013 (60) | G1: attention control (telephone calls every 2 weeks for 16-weeks) (n=24)<br>G2: endurance exercise training (exercised for one hour, three times per week for 16-weeks. Each session had three phases: 10-minute warm-up, stimulus, and 10-minute recover) (n=30) | Aerobic training | Bicycle | 16 |
| Laoutaris, ID, 2013 (61) | G1: Aerobic training (Patients in both the ARIS and the AT group were trained 3 times a week for 12 weeks. Warming-up and cooling down exercises lasted 5 min each for both groups. Patients in both the ARIS and the AT group were trained 3 times a week for 12 weeks.<br>Warming-up and cooling down exercises lasted 5 min each for both groups. In the AT group, 45 min AT was achieved during the first 6 weeks of training and patients continued to exercise at this training time for the remaining 6 weeks of the program. In this group, the total exercise time was 55min) (N=14)<br>G2: Resistance+inspiratory training (In the ARIS group, 30 min AT was achieved within the first 3 weeks of training and patients continued to exercise for this training time for the remaining 9 weeks of the program. In this group, patients also underwent 15 min RT and 20 min IMT. Thus, the total exercise time including warming and cooling down periods reached 1 h and 15 min (Fig. 1)) (N=13) | Aerobic training/ Combine training | CAT/AT+IMT | 12 |
| Mehani, S. H., 2013 (62) | G1: Control group (n=15)<br>G2: Training group (according to 55–80% of heart rate reserve for a period of 7 months) (n=15) | Aerobic training | CAT | 49 |
| Mezzani, A., 2013 (63) | G1: Control (n=15)<br>G2: Aerobic training (5 sessions a week of 30-min cycling (60 rpm) at a work rate eliciting a heart rate corresponding to that at the first ventilatory threshold, preceded and followed by 5-min warm-up and cool-down periods of unloaded cycling) (n=15) | Aerobic training | Bicycle | 21 |
| Adamopoulos, S, 2014 (64) | G1: AT/IMT group (AT involved 45 min of ergometer training at 70–80% of maximum heart rate, three times a week for both groups; performed at 60% of sustained maximal inspiratory pressure ) (n=21)<br>G2: AT/SHAM group (performed at 10% of SPImax, using a computer biofeedback trainer for 30 min, three times a week) (n=22) | Aerobic training/ Combine training | Bicycle/AT+IMT | 12 |
| Antunes-Correa, L. M., 2014 (65) | G1: Untrained (n=17)<br>G2: Exercise-trained (three 60-min exercise sessions/week. Each exercise session consisted of 5-min stretching exercises, 30-min of cycling on an ergometer bicycle in the first 15days and up to 40-min in the rest of the period, 10-min of local strengthening exercises, 5-min of cool down with stretching exercise) (n=17) | Combine training | AT+ST | 4 |
| Chrysohoou, C, 2014 (66) | G1: Standard care (N=39)<br>G2: High intensity interval (Patients were instructed to exercise at an intensity equivalent to 80% WRpeak and progressively to 100% of WRpeak for 30 s alternated with 30 s of rest for an accumulative period of 45 min/ day, 3 days/week for 12 consecutive weeks) (N=33) | HIIT | HIIT | 12 |

**Table S2** (*continued*)


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**Table S2** (*continued*)

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| de Meirelles, LR, 2014 (67) | G1: Standard care (N=15)<br>G2: Aerobic+Resistance (Exercise training was realized three times per week for 6 months in a dedicated facility under medical supervision. Each session lasted approximately 90 min and consisted of aerobic, resistance, and stretching exercises. Aerobic training comprised 30 min of treadmill exercise. Exercise intensity was established as heart rate levels correspondent with 5–15% above the ventilatory threshold obtained in baseline cardiopulmonary exercise testing. The resistance training programme was designed to improve whole body skeletal muscle strength. It consisted of two to three sets of 10–15 repetition maximum of eight to ten exercises for the major muscle groups) (N=15) | Combine training | AT+ST | 42 |
| Georgantas, A, 2014 (68) | G1: high-intensity aerobic interval training+strenth training (Participants underwent aerobic exercise training, with or without strength training, on electromagnetically braked cycle ergometers 3 times weekly, for 12 weeks. Strength training, 19 included exercises for the quadriceps, hamstrings, biceps, and shoulder muscle girdle. Three sets of 10 to 12 repetitions were performed for each exercise) (N=22)<br>G2: high-intensity aerobic interval training (Patients assigned to the AIT group exercised at 50% of peak work rate achieved during baseline Steep Ramp Test (SRT), as previously described, 3 alternating 30 seconds of exercise with 60 seconds of rest for 40 minutes per session. 3 By using 50% of peak work rate achieved during SRT, we have applied a high-intensity interval exercise protocol) (N=20) | Combine training/HIIT | HIIT+ST/HIIT | 12 |
| Koufaki, P., 2014 (69) | G1: Aerobic continuous exercise (Exercise stimulus progressed from 3 separate bouts of cycling of 7–10 min in duration, to a single 40 min of continuous cycling bout by 5–6 months) (n=9)<br>G2: High intensity interval (2 × 15 min bouts of cycling, comprising very low intensity active cycling phases of 1 min at 25–40 watts followed by high intensity cycling for 30s at 50% of the maximum workload achieved during the MsEC test) (n=8) | Aerobic training/HIIT | Bicycle/HIIT | 42 |
| Palau, P, 2014 (70) | G1: Standard care (N=12)<br>G2: inspiratory muscle training (Patients allocated to the IMT arm were instructed to train at home twice a day, for 20 minutes during 12 weeks using a threshold inspiratory muscle trainer (Threshold IMT, Respironics). All of them were instructed by a respiratory therapist and educated to maintain diaphragmatic breathing during the training period. The subjects started breathing at a resistance equal to 25–30% of their MIP for 1 week) (N=14) | IMT | IMT | 12 |
| Angadi, S. S., 2015 (71) | G1: Aerobic continuous training (Patients in MI-ACT began with 15 min of continuous exercise at 60% peak heart rate (PHR), increasing to 30 min of continuous exercise at 70% PHR by the start of the 2nd week) (N=9)<br>G2: High intensity interval (Patients in HIIT started with intervals of 2 min duration at 80-85% PHR, separated by 2 min of recovery at 50% of PHR to achieve a total “on-time” of 16 min of high-intensity exercise. They were progressed by the start of the second week of training to completing four, 4-min intervals at 85-90% PHR, separated by 3 min at 50% PHR. Each training session began with a 10-min warm-up at 50% of PHR and ended with a 5-min cool down at the same intensity (*Figure 1*)) (N=6) | Aerobic training/HIIT | CAT | 4 |
| Benda, NM, 2015 (72) | G1: Aerobic continuous training (30 minutes at 60–75% of maximal workload) (n=10)<br>G2: High intensity interval (10*1-minute at 90% maximal workload—alternated by 2.5 minutes at 30% maximal workload) (n=10) | Aerobic training/HIIT | Bicycle/HIIT | 12 |
| Groehs, R. V., 2015 (73) | G1: untrained (n=13)<br>G2: exercise trained (three 60-min exercise sessions/week. Each exercise session consisted of 5-min stretching exercises, 30-min of cycling on an ergometer bicycle in the first 15 days, and up to 40 min in the rest of the period, 10 min of local strengthening exercises, 5 min of cool down with stretching exercises) (n=13) | Aerobic training | Bicycle | 16 |
| Kim, C., 2015 (74) | G1: moderate continuous training (The MCT group exercised for a total of 45 mins. Their program consisted of a 10-min warm-up, followed by a 25-min walk on a treadmill continuously at 70%Y85% of HRR, and a 10-min cooldown) (n=14)<br>G2: high interval training (The HIT group exercised for a total of 45 mins. Their program consisted of a 10-min warm-up at 50%Y70% of HRR, followed by four times of 4-min intervals of walking on a treadmill at 85%Y95% of HRR with three active pauses of 3-min walking at 50%Y70% of HRR, and a 10-min cooldown at 50%Y70% of HRR) (n=14) | Aerobic training/HIIT | Running/HIIT | 6 |

**Table S2** (*continued*)


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**Table S2** (*continued*)

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| Nolte, K, 2015 (75) | G1: Standard care (N=20)<br>G2: Resistance+aerobic training (Weeks 1–4: aerobic endurance training (cycling, 2 times a week) of increasing intensity and duration (20–40 min). Training intensity was tailored individually to a target heart rate of 50–60% of peak oxygen uptake ($VO_2$) during baseline spiroergometry. Afterwards, workload was increased to a target heart rate of 70% of baseline peak $VO_2$ (3 times a week). Also starting at week 5, resistance training (bench press, leg press, leg curl, rowing machine, triceps dip, latissimus pull down) was added (2 times a week). Resistance training was performed for 15 repetitions per exercise per session at a work load corresponding to 60–65% of the 1 repetition maximum measured at the end of week 4) (N=24) | Combine training | AT+ST | 42 |
| Piotrowicz, E., 2015 (76) | G1: Standard care (N=32)<br>G2: Nordic walking (The training session consisted of three parts: a warm-up lasting 5–10 min (breathing and light resistance exercises, calisthenics), a 15–45 min NW training, and a five-minute cool-down. The initial duration of the aerobic NW training depended on the functional capacity in baseline CPET. If baseline peak $VO_2$ was <14 ml/kg/min, we started at 10min/NW training/day, if baseline peak $VO_2$ was 14–20 ml/kg/min, we started at 15 min/NW/day; and if baseline peak $VO_2$ was >20 ml/ kg/min, we started at 20 min/NW/day. Later on we tended to gradually prolong the time allotted to the training session so that the final period of time would reach 45–60 min. In order to achieve this optimal prolonged training duration usually two weeks needed to elapse. Patients trained five times a week) (N=75) | Aerobic training | Walking | 8 |
| Smolis-Bąk, E., 2015 (77) | G1: Standard care (N=26)<br>G2: strenth+inspiratory training (The CRT-Ex patients initially trained in the Rehabilitation Unit (for 3 weeks on average) and then at home with telemonitoring 5 times a week for 8 weeks. Prior to CRT-D implantation and after 3–4 and 12months, all patients had cardiopulmonary exercise testing (CPX) on a treadmill using the Naughton protocol. The training program included active exercises of small and subsequently larger muscle groups of the lower and upper limbs (isometric exercises with normal inspiration/ expiration), respiratory exercises, range-of-motion exercises of the shoulder joint on the implantation side (passive, active-passive, self-assisted, active)) (N=26) | Combine training | ST+IMT | 28 |
| Stevens, A. L., 2015 (78) | G1: Standard care (N=7)<br>G2: strenth+inspiratory training (Patients trained 5 times every 2 weeks for 12 weeks. The program consisted of a 5-minute warm-up at 0 to 25 W on a cycle ergometer followed by progressive endurance and resistance training. Endurance training initially involved 2 cycling bouts followed by 2 bouts of walking on a treadmill, The 4 exercise bouts were alternated with rest periods of 2 minutes. Resistance training consisted of leg press and leg extension for the lower limbs and chest press and vertical traction for the upper body, Training loads were set at the maximum attainable load between 50% and 70% 1-RM. This was repeated after 6 weeks) (N=15) | Combine training | ST+IMT | 12 |
| Yaylalı, YT, 2015 (79) | G1: no training (n=11)<br>G2: 30 minutes of interval training (The training groups exercised for 12 weeks, involving 3 sessions per week under physician supervision. Cycle ergometers were used for aerobic exercise. Each session consisted of a 5-minute warm-up and stretching period, followed by 30 minutes of aerobic exercise with an intensity of 50% to 75% of heart rate reserve, calculated by Karvonen formula, and ended with a 5-min cool-down period. Patients in the IT group did aerobic exercise for 30 seconds at 50% to 75% of heart rate reserve, calculated by Karvonen formula, followed by rest intervals of 30 seconds) (n=17)<br>G3: 30 minutes of continuous training (Those randomized to CT exercised without resting intervals) (n=13) | Aerobic training/HIIT | Bicycle/HIIT | 12 |
| Acanfora, D, 2016 (80) | G1: trained (a 20 min period was considered for the first two weeks training, increased to 30 min from the third week to 40 min at the fourth week. The intensity of the training was set at 60–70-85% of the individual $VO_2$ obtained from CPET measurements) (n=36)<br>G2: untrained (n=36) | Aerobic training | CAT | 4 |
| Antonicelli, R, 2016 (81) | G1: usual care (n=163)<br>G2: exercise training (The ET protocol involved supervised training sessions for 3 months in the hospital followed by home-telemonitored sessions for 3 months) (n=150) | Aerobic training | Bicycle | 42 |
| Höllriegel, R, 2016 (82) | G1: Control Group (continued their sedentary lifestyle) (n=8)<br>G2: Training Group (During the first 3 weeks, patients underwent 3 to 6 ET sessions daily, each 5 to 20 minutes individualized to each patient, on a cycle ergometer. performed one supervised group training session for 60 minutes per week) (n=15) | Aerobic training | Bicycle | 84 |

**Table S2** (*continued*)


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**Table S2** (*continued*)

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| Kitzman, D. W., 2016 (83) | G1: Standard care (N=49)<br>G2: Aerobic training (Participants randomized to either group receiving Exercise completed 1-hour supervised exercise sessions 3 times per week for 20-weeks consisting primarily of walking exercise using an individualized exercise prescription based on the exercise test results, and intensity level was progressed as tolerated and based primarily on heart rate reserve) (N=51) | Aerobic training | Running | 20 |
| Safiyari-Hafizi, H, 2016 (84) | G1: Standard care (n=20)<br>G2: High intensity interval+resistance training (The EXP group was enrolled in a 12-week supervised home-based walking program that was individualized according to the stress test, medications, and activity level. Participants exercised using bouts of high intensity work phases (80-85% $VO_2$peak) followed by periods of active recovery (40-50 % $VO_2$peak)) (n=20) | Combine training | ST+HIIT | 12 |
| Ellingsen, Ø, 2017 (85) | G1: regular exercise (a session of moderate-intensity training at 50% to70% of maximal heart rate every 3 weeks) (n=73)<br>G2: moderate continuous training (60% to 70% of maximal heart rate and lasted 47 minutes) (n=65)<br>G3: high intensity interval (four 4-minute intervals aiming at 90% to 95% of maximal heart rate separated by 3-minute active recovery periods of moderate intensity; lasted 38 minutes) (n=77) | Aerobic training/HIIT | CAT/HIIT | 12 |
| Hwang, R., 2017 (86) | G1: Standard care (N=29)<br>G2: Aerobic training (This traditional heart failure rehabilitation program was led by physiotherapists over a 12-week period; it consisted of 60 minutes of exercise per session, two sessions per week, at the treating hospital. Each session consisted of a 10-minute warm-up, 40-minutes of aerobic and strength exercises, and a 10-minute cool-down) (N=24) | Combine training | AT+ST | 12 |
| Maldonado-Martín, S., 2017 (87) | G1: Standard care (N=24)<br>G2: Aerobic training (The duration of the exercise training was a minimum of 16-weeks for a total of 48 sessions and was conducted three days a week with each session lasting a total of 60 minutes. After 10 minutes of light exercise and stretching, patients exercised an equal time on a cycle ergometer (Schwinn Airdyne) and over ground walking on an indoor track. The duration of each modality increased gradually to a maximum of 20 minutes per session. The goal of exercise program was to increase each patient's total exercise volume by 5% each week. Throughout the training period, the exercise intensity was maintained between 50 and 70% of the $VO_2$peak and regulated with heart rate and perceived exertion) (N=23) | Aerobic training | Bicycle | 16 |
| Villelabeitia Jaureguizar, K., 2017 (88) | G1: Moderate continuous training (n=36)<br>G2: High intensity interval (n=37) | Aerobic training/HIIT | Walking/HIIT | 8 |
| Chen, DM, 2018 (89) | G1: Standard care (n=33)<br>G2: Baduanjin exercise (Patients in the intervention group underwent a 12-week Baduanjin exercise program consisting of 12 weeks of Baduanjin exercise, a 35-minute Baduanjin exercise demonstration video, a picture-based educational brochure, and a performance record form. The participants were led by the demonstration video to perform the Baduanjin exercise at home three times per week for 10 weeks. Participants were asked to record their daily Baduanjin exercise schedule on a performance record form for 12 weeks) (n=30) | Aerobic training | OAT | 12 |
| Chen, YW, 2018 (90) | G1: Standard care (N=18)<br>G2: Aerobic training (Home-based cardiac rehabilitation was conducted by requesting the interventional group to carry out aerobic exercise at least 3 times per week, for a duration of at least 30 minutes each time. Each patient was required to perform cardiac rehabilitation with an intensity measuring 60% to 80% of peak heart rate, based on the results of his or her initial CPET) (N=19) | Aerobic training | CAT | 21 |
| Doletsky, A, 2018 (91) | G1: Standard care(N=22)<br>G2: Aerobic interval training (Exercise intensity of interval training was set at 50% of the maximal load achieved during the ramp-test. Each training session consisted of a 3-min warm-up period, a training period and a 2-min recovery period. Training periods consisted of 20-s exercise phases each followed by 40 s of rest pedalling with 10W load. Ramptests were repeated at the beginning of the second and third weeks of training to adjust exercise load; exercise time was increased up to 5–10 minutes on the basis of individual tolerance. Interval training continued for three weeks, five days per week (excepting weekends)) (N=24) | HIIT | HIIT | 21 |

**Table S2** (*continued*)


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**Table S2** (*continued*)

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| Munch, GW, 2018 (92) | G1: Aerobic exercise (a 10-min standardized warm-up at 50% of Wpeak attained during the incremental cycling test and 35 min of continuous cycling at 75% of Wpeak) (n=14)<br>G2: resistance training (4 sets of isotonic resistance exercises) (n=12) | Aerobic tarining/ Strength training | Bicycle/ST | 6 |
| Peng, X., 2018 (93) | G1: Standard care (N=41)<br>G2: Aerobic training (he 2-month exercise training program consisted of 2 stages: the first stage (1–4 weeks) was focused on endurance exercises, 3 with 3 20-minute sessions per week. The training modalities included walking and jogging. Walking was the most common modality performed by patients in the first stage because of its simplicity. The patients received a total of 12 20-minute sessions of exercise training in the first stage, with 3 sessions per week. The second stage (5–8 weeks) included resistance and muscular strengthening exercises in 5 30-minute sessions per week. The patients performed endurance exercises before progressing to resistance exercises. The patients received a total of 20 30-minute sessions of exercise training in the second stage, with five sessions per week) (N=42) | Aerobic training | Running | 28 |
| Servantes, DM, 2018 (94) | G1: Standard care (N=18)<br>G2: Aerobic+strenth training (The sessions were supervised by a physiotherapist and a cardiologist. The protocol consisted of a warm-up period of 10 min followed by aerobic training (treadmill and cycloergometer; 30 min in the first month and 45 min in the last 2 months) and strength training (three exercises for upper limbs and four exercises for lower limbs, with a 1-min rest period, with free weights). The aerobic exercise intensity was established by using heart rate levels that corresponded to an anaerobic threshold ($VO_2$ anaerobic threshold). The strength exercise intensity was determined by 50% to 60% of the one-repetition maximum for elbow and knee extension/flexion) (N=17) | Combine training | AT+ST | 21 |
| Tanaka, Y, 2018 (95) | G1: control exercise group (N=15)<br>G2: interventional exercise group (Exercise in IG and CG was performed on a cycle ergometer (Aerobike 75XL III, Combi Wellness) at an intensity of 40–70% of the peak $VO_2$/W for 15 min three times a week for 6 months. Interventional exercise group patients remained seated on the saddle of the cycle ergometer with their feet on the pedals. Each training session began with a 5 min warm-up period, followed by adjustment of the cycle ergometer resistance for each individual) (N=15) | HIIT | HIIT | 42 |
| Besnier, F, 2019 (96) | G1: moderate intensity continuous training (cycling 30 min at 60% of peak power output) (n=15)<br>G2: high-intensity interval training (two 8-min blocks of interval training separated by 4 min of passive recovery; lasted 3 hr/day, 5 days/week, for 3.5 weeks) (n=16) | Aerobic training/HIIT | CAT/HIIT | 3.5 |
| Chou, CH, 2019 (97) | G1: general healthcare (n=17)<br>G2: High-intensity interval training (3-minute intervals at 40% and 80% of $VO_2$peak, n=17) for 30 minutes/day, 3 days/week for 12 weeks) (n=17) | HIIT | HIIT | 12 |
| Prince, SA, 2019 (98) | G1: Nordic walking (a 15-minute chair warm-up (excluded resistance exercise); 10–15 minutes of walking with NW poles for the first 1–3 weeks, progressing to 30 minutes for the remaining weeks; and 15 minutes of cool-down exercises) (n=29)<br>G2: Aerobic exercise+resistance training (included aerobic exercise (e.g. walking, cycling) and resistance training) (n=31) | Aerobic training/ Combine training | Walking/AT+ST | 12 |
| Schertz, A, 2019 (99) | G1: Standard care+no ET (N=7)<br>G2: motivational interviewing and training+ET (Participants assigned to the MI intervention group received monthly counselling for 6 months (total of seven sessions). For the first two and the last session, participants met with the counsellor face to face for about 45 min. Based on participants' preference, the remaining sessions could be conducted via telephone or face to face and lasted 15– 30 min) (N=7) | Aerobic training | CAT | 42 |
| Donelli da Silveira, A, 2020 (100) | G1: Aerobic continuous training (47 min at moderate intensity) (n=9)<br>G2: High-intensity interval training (a warm-up of 10 min at moderate intensity, four intervals of 4 min at high intensity, alternating with three intervals, and a 3-min cool down phase at moderate intensity, totaling 38 min) (n=10) | Aerobic training/HIIT | Running/HIIT | 12 |
| Lan, NSR, 2020 (101) | G1: Standard care (n=12)<br>G2: Aerobic training (AT commenced at 50% to 60% of baseline peak $VO_2$ and progressed to 60% to 70% of peak $VO_2$ after 6 weeks, so that the relative intensity was consistent with the RT group) (12)<br>G3: resistance training (For the first 6 weeks of training, weights were maintained at 50% to 60% one-repetition maximum, and a 2: 1 (60: 30 sec) work/rest ratio was applied. For the second 6 weeks, weights were increased to 60% to 70% one-repetition maximum with a 1:1 (45:45 sec) work/rest ratio) (n=12) | aerobic training/ Strength training | Running/ST | 12 |

**Table S2** (*continued*)


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**Table S2** (*continued*)

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| Turri-Silva, N, 2021 (102) | G1: Standard care (n=8)<br>G2: circuit-resistance training (CRT exercises were executed to target large muscle groups, including: 1) pull-down, 2) leg press, 3) pectoralis, 4) flexor chair, 5) shoulder press, and 6) extensor chair machines. Strength measurements were estimated by a one-repetition maximum test (1RM) [49]. The CRT session was preceded by a 10-minute warm-up session led by a physiotherapist, consisting 5 minutes of muscle stretching and 5 minutes of dynamic movements) (n=6)<br>G3: High intensity interval (The exercise sessions occurred 3 times per week along 36 sessions with a matched session duration (approximately 50 minutes). Training familiarization for both modalities was established for the patient's adaptation (6 to 10 sessions) according to the patients performance to be able to reach HIIT prescription. HIIT protocol periods was characterized by 3 minutes of exercise at high intensity followed by 4 minutes of exercise at moderate intensity, totalizing 4 cycles of7 minutes, resulting in 28 minutes of HIIT) (n=8) | Strength training/HIIT | ST/HIIT | 12 |
| Austin, J.k, 2005 (103) | G1: Standard care (n=94)<br>G2: Aerobic exercise (The experimental regimen consisted of an 8-week cardiac rehabilitation programme that was co-ordinated by the clinical nurse specialist. Patients attended classes twice weekly for a period of 2.5 h. Patients performed aerobic endurance training and low resistance training/high repetitive muscular strength work. To encourage patients to undertake exercise at the prescribed level, they were issued with the necessary guidance to facilitate exercise for an additional three times per week at home) (n=85) | Aerobic training | Bicycle | 24 |
| Roveda, F., 2003 (104) | G1: Subjects underwent exercise training under supervision at the Heart Institute. The four-month training program consisted of three 60-min exercise sessions/week. Each exercise session consisted of 5 min stretching exercises, 25 min of cycling on an ergometer bicycle in the first month and up to 40 min in the last three months, 10 min of local strengthening exercises (sit-ups, push-ups, and pull-ups), 5 min of cool down with stretching exercises. The exercise intensity was established by HR levels that corresponded to anaerobic threshold up to 10% below the respiratory compensation point obtained in the cardiopulmonary exercise test. In one patient the respiratory compensation point was not detectable. In that patient, the exercise training was determined at the anaerobic threshold. When a training effect was observed, as indicated by a decrease by 8% to 10% in HR during exercise, the bicycle work rate was increased by 0.25 or 0.5 kpm to return to the target HR levels. Aerobic exercise training duration increased progressively so that all patients could perform 40 min of bicycle exercise at the established intensity(n=7)<br>G2: Standard care (n=9) | Combine training | AT+ST | 28 |
| Linke, Axel, 2015 (105) | G1: During the first 2 weeks, patients in group T exercised in hospital 4 to 6 times daily for 10 minutes each on a bicycle ergometer adjusted to a workload at which 70% of peak oxygen uptake was reached. The target heart rate for home training was defined as the heart rate reached at 70% of maximum oxygen uptake. Patients were provided with bicycle ergometers for home exercise training. They were encouraged to exercise close to their target heart rate daily for 20 minutes for a period of 6 months and were expected to participate in one group training session, consisting of walking, noncompetitive ball games, and calisthenics, for 60 minutes each week (n=12)<br>G2: Control group (n=11) | Aerobic training | CAT | 42 |
| Laoutaris, Ioannis D., 2007 (106) | G1: high intensity training group (n=15, age 53+/-2 years) exercised at 60% of sustained maximal inspiratory pressure(n=15)<br>G2: low intensity training group (n=23, age 59+/-2 years), exercised at 15% of sustained maximal inspiratory pressure, three times per week for 10 weeks (n=23) | HIIT/IMT | HIIT/IMT | 10 |
| Roditis, Petros, 2007 (107) | G1: Patients assigned to the CT group exercised on electromagnetically braked cycle ergometers (Cateye Ergociser, EC1600, Tokyo, Japan) at an intensity that was initially equivalent to 50% of baseline pWR for 40 min per day, 3 days per week, for a total of 36 sessions. Any missed sessions were added to the end of the program so that 36 sessions were completed. (n=10)<br>G2: the (IT) group exercised for the same period of time, weekly frequency and total duration as the CT group, but at an intensity that was initially equivalent to 100% of baseline pWR with 30 s exercise, alternating with 30 s of rest (during the 40 min session) (n=11) | Aerobic training/HIIT | Bicycle/HIIT | 12 |

**Table S2** (*continued*)


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**Table S2** (*continued*)

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| Babu, A. S., 2011 (108) | G1: Step 1<br>Sitting in bed, breathing exercises, ankle foot movements (10 reps × q1h)<br>AROM exercises to elbow and wrist (2 sets, 5 reps, tid)<br>AROM exercises to shoulder and lower limbs (2 sets, 5 reps, tid) Walking in the room (RPE 3–4/10)<br>Progression of exercises (4 sets, 5 reps tid) Supervised walking a minimum of 5 min (RPE 3–4/10)<br>Progression of exercises (6 sets, 5 reps tid) Walking time progressively increased to a maximum of 10 min or as tolerated (n=15)<br>G2: Control group(n=15) | Combine training | AT+ST | 8 |
| Caminiti, G, 2011 (109) | G1: After the completion of baseline testing, subjects were randomized into two treatment groups. Patients of CT group performed a combined training (HT+ET) 3 times/week while patients of<br>G2: ET group performed only ET, 3 times/week.<br>Patients of CT group performed HT and ET in different days; this was because most of the participants refused to do cycling/ walking after HT due to weakness. All patients of the two groups were on top of their maximal medical therapy. | Combine training/ Aerobic training | CAT/AT+ST | 24 |
| Gary, R. A., 2011 (110) | G1: Participants performed the combined aerobic and resistance exercise program for 12 weeks. They also received individualized instruction and a demonstration of how to monitor and record HR using the HR monitor, use of the 6- to 20-point Borg RPE Scale,28 and any symptoms experienced during the walking or strength training sessions. Supervised weekly home-based sessions for 8 consecutive weeks and then every other week were conducted by a member of the research team (nurse or exercise specialist). At each home visit, the exercise prescription was adjusted, which progressively increased both walking and resistance exercise. Participants in the exercise group also received a DVD and exercise booklet as a reference to use during the unsupervised sessions. (n=12)<br>G2: Control training (n=12) | Combine training | AT+ST | 12 |
| Haykowsky, M. J., 2012 (111) | G1: As previously described, medically supervised endurance exercise training was performed 3 days/week for 4 months during which time the exercise intensity progressively increased from 40% to 70% heart rate reserve26. Exercise training sessions consisted of walking on a track and cycling on a Schwinn Airdyne (Louisville, Colo) for up to as much as 60 min/ session including warm-up and cool-down. Any missed sessions were made up so all subjects completed a minimum of 40 out of 48 training sessions (n=22)<br>G2: Control group (n=18) | Aerobic training | Bicycle | 28 |
| Norman, J. F., 2012 (112) | G1: The aerobic component consisted of exercising at an intensity of 40% to 70% heart rate reserve (HRR), based on the CPET, or at a Rating of Perceived Exertion of 11-14 on the Borg category scale. Aerobic exercise duration was for 30 minutes at the prescribed exercise intensity plus a 15 minute warm-up and 15 minute cool-down. Individuals were given personal heart rate monitors to use throughout the study to monitor their exercise intensity during training sessions. Prescribed frequency for aerobic exercise was 3 days per week. Resistance training included 8 to 10 exercises (upper and lower extremity) performed for one set of 10 to 15 repetitions, 2 days per week, using weight machines, free weights or elastic bands based on their exercise preferences (n=20)<br>G2: Control group (n=20). | Combine training | AT+ST | 24 |
| Fayazi, S., 2013 (113) | G1: Participants allocated to exercise group were instructed to home walking exercise (activity logs) for 30 minutes daily and 3 days a week for 8 weeks and consisted of three components: (i) a warm-up period (5 minutes), (ii) walking period (20 minutes, in two 10-minute series separated by 5 minutes of rest), and (iii) cool-down period (5 minutes) (n=30).<br>G2: Control group(n=30) | Aerobic training | Walking | 8 |
| Iellamo, Ferdinando, 2013 (114) | G1: For all patients, the exercise training program consisted of “uphill” treadmill walking, 2 days a week for the first 3 weeks, 3 days a week for the second 3 weeks, 4 days a week for the third 3 weeks, 5 days a week for the last 3 weeks. Specifically, patients in the ACT group walked continuously at a moderate training intensity, ~ 45–60% of HRR for 30–45 min, according to the training periodization.<br>G2: Patients in the AIT group warmed-up for 9 min, before walking four 4-min intervals by 2–4 times at 75–80% of HRR, with active pauses of 3 min of walking at 45–50% of HRR | Aerobic training/HIIT | Running/HIIT | 12 |

**Table S2** (*continued*)


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**Table S2** (*continued*)

| Author, year | Description of Exercise in studies | Type of exercise | Type of subgroup exercise | Duration of intervention (week) |
|---|---|---|---|---|
| Hassanpour Dehkordi, A., 2015 (115) | G1: The exercise program was performed three sessions per week for 24 weeks. The exercise program included 40 minutes, including 5-10 minutes for warmup, 25 - 30 minutes of exercise (walking), and 5 minutes for cooling down) MET (Metabolic Equivalent) value of various common activities was light intensity activity: < 3MET). The patients, immediately after enrollment, underwent simple walking in a sport facility or gym in the hospital while they were supervised by a nurse or cardiologist. Exercise started until heart rate reached equal to 60% of heart rate reserve. After 6 sessions, the duration of the exercise (walking) was increased to 30 to 35 minutes, and heart rate to 70% of heart rate reserve (n=30)<br>G2: Control groups (n=31) | Aerobic training | Walking | 24 |
| Banks, AZ, 2016 (116) | G1: Patients randomized to exercise were scheduled to participate in 3 supervised exercise sessions/week for 3 months. Patients exercised using a treadmill or stationary cycle ergometer as their training mode. Patients were encouraged to begin home-based exercise after 18 supervised sessions and to fully transition to home exercise after 36 supervised sessions. Adherence was defined as 90 min/wk of exercise during months 1–3 and 120 min/wk during subsequent months (n=780, NO DM)<br>G2: Control group (n=801, NO DM) | Aerobic training | CAT | 21 |
| Tzanis, G., 2017 (117) | G1: six patients were assigned to the AER group, exercised for 3min at 50% oxygen uptake at peak exercise ($VO_2p$) followed by 4 cycles alternating 4min of exercise at 80% of $VO_2p$ with 3min at 50% of $VO_2p$, for a total duration of 31 min (n=6).<br>G2: Seven patients were assigned to the COM group, exercised for 3min at 50% of $VO_2p$ followed be 2 cycles alternating 4min of exercise at 80% of $VO_2p$ with 3min at 50% of $VO_2p$, for a total duration of 17min followed by 14min of strength training. Strength training included exercise for the quadriceps (leg extensions) and the hamstrings (leg curls). Each extremity was trained separately for 2-4 sets of 10-12 repetitions, with 306 Page 6 of 30 (n=7)<br>G3: Control (n=13) | HIIT/Combine training | HIIT/AT+ST | 21 |
| Iliou, MC, 2018 (118) | G1: ET,180 minutes per week of supervised exercise training. The training programme included 20—30 minute bouts of bicycle or treadmill endurance and another dynamic physical activity (calisthenics, resistance training, water-based exercise, walking, etc). The intensity of endurance exercise training was individualized according to the ventilatory threshold and/or was set at 12—14 on the Borg scale. (n=58)<br>G2: ET+IMT (n=80) | Aerobic training/ Combine training | CAT/AT+ST | 9 |
| Oliveira, MF, 2018 (119) | G1: The ET+NIV group performed aerobic ET associated with NIV once a day, for 8 consecutive days;(n=11)<br>G2: ET+Sham group performed aerobic exercise with placebo NIV once a day, also for 8 consecutive days. (n=9)<br>G3: The control group (Control) received only medical treatment and did not perform aerobic exercise training (n=8) | Combine training/ Aerobic training | AT+IMT/CAT | 1 |
| Dalal, HM, 2019 (120) | G1: manual for patients with a choice of two structured exercise programmes: a chair-based exercise and a progressive walking training programme. Patients were advised to exercise 3 times per week, starting from their own personal level and gradually building up over 2–3 months in time/distance/walking pace. (n=107)<br>G2: Control group (n=109) | Aerobic training | Running | 12 |
| Palau, P, 2019 (121) | G1: These patients were instructed to train at home twice daily (20 minutes each session) for 12 weeks using a threshold inspiratory muscle trainer (Threshold IMT, Respironics Inc) (*Figure 1* of the supplementary material). They were instructed by a respiratory therapist to maintain diaphragmatic breathing during the training period. Participants started breathing at a resistance equal to 25% to 30% of their maximal inspiratory pressure for 1 week. The respiratory therapist examined the patients weekly by checking the diary card and measuring their maximal inspiratory pressure. The resistance was modified each session to 25% to 30% of their measured maximal inspiratory pressure (n=15)<br>G2: Control group (n=13) | IMT | IMT | 12 |
| Yeh, GY, 2011 (122) | G1: The tai chi intervention consisted of 1-hour group classes held twice weekly for 12 weeks. We used the standard protocol of a pilot trial24 in patients with HF. The development of that program was guided by similar interventions used in tai chi trials36 with elderly patients and those with limited mobility. The protocol included traditional warm-up exercises and 5 subsequent simplified tai chi movements. Each cohort was taught by 1 or 2 certified and experienced instructors (n=50)<br>G2: Control group (n=50) | Aerobic training | OAT | 12 |


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**Table S3** Original data for studies

| Author, year | Sex | NYHA | LVEF at baseline (mean) | Age, years | N | Peak $VO_2$ mean ± SD (mL/kg/min) | HR MAX (beats/min) | LVEF(%) | MLHFQ | 6MWT(M) | Max workload (W) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | The data are in Table S2 from top to bottom G1-G2-G3-G4 | | | | | |
| Hambrecht, R., 2000 (1) | men:50% | NYHA I-III | 27.5±9% | 54±8.4 | 64 | 23.0±4.7<br>18.1±4.1 | 160±24<br>150±23 | 35±9<br>33±9 | _ | _ | _ |
| Oka, R. K., 2000 (2) | men:77.5% | NYHA II-III | <40% | 30-76 | 24 | 18.89±4.69<br>19.00±3.82 | 147±23<br>135±20 | _ | _ | _ | _ |
| Pu, C. T., 2001 (3) | men:0% | NYHA I–IV | 36.2±2.7% | 76.6±2.1 | 16 | 15.08±1.62<br>14.75±0.94 | 111±9<br>128±12 | 37.8±2.6<br>36.0±2.8 | _ | 421±50<br>362±31 | _ |
| Willenheimer, R., 2001 (4) | men:57.5% | NYHA I–IV | 36.6±11% | 64±6.7 | 37 | 17.3±4.4<br>16.6±3.6 | _ | _ | _ | _ | _ |
| Parnell, M. M., 2002 (5) | men:90.5% | NYHA II-III | 25±2% | 55±13 | 21 | _ | _ | _ | 24±5<br>28±7 | 547±34<br>515±29 | _ |
| Giannuzzi, P., 2003 (6) | _ | NYHA II-III | 25±4.5% | 60.5±7 | 89 | 16.2±3.6<br>13.7±2.2 | 140±15<br>139±16 | 29±4<br>25±5 | _ | 461±102<br>368±107 | 93±23<br>78±18 |
| Gielen, Stephan, 2003 (7) | men:100% | NYHA II-III | 25.4±2.8% | 54±2.7 | 20 | 26.1±1.5<br>18.1±1.1 | _ | _ | _ | _ | _ |
| Pozehl, Bunny, 2003 (8) | men:87% | NYHA II–IV | 29.1±7.4% | 67.4±10.6 | 23 | 17.02±0.76<br>16.74±1.24 | _ | _ | 29.0±5.52<br>46.30±11.48 | 428.22±14.97<br>400.25±24.69 | _ |
| Corvera-Tindel, T., 2004 (9) | men:98.7% | NYHA II–IV | 27±8.8% | 62.6±10.6 | 79 | 15.3±3.8<br>15.2±4.1 | _ | _ | _ | 407.55±82.97<br>385.24±77.57 | 85.0±27.2<br>72.2±25.1 |
| Koukouvou, Georgia, 2004 (10) | men:100% | NYHA II-III | <40% | 52.5±9.8 | 26 | 30.3±4.3<br>22.8±5.1 | 156.5±10.1<br>147.2±7.7 | _ | 34.1±13.0<br>45.2±9.0 | _ | _ |
| Sabelis, L. W., 2004 (11) | men:100% | NYHA II-III | 26.3±7.2% | 59.6±8.3 | 29 | 21.7±5.0<br>18.9±4.6 | _ | 29·2±8·6<br>24·1±10·6 | _ | _ | 128±36<br>112±34 |
| van den Berg-Emons, Rita, 2004 (12) | men:73.5% | NYHA II-III | 25.6±8.1% | 58.6±11.2 | 34 | 17.8±4.0<br>15.8±2.9 | 133±18<br>132±26 | _ | 18.1±18.5<br>26.5±12.7 | 501±96<br>448±84 | _ |
| Yeh, Gloria Y., 2004 (13) | men:63.3% | NYHA I–IV | 23% ±7% | 64±13 | 30 | 11.4±3<br>10.4±6 | _ | _ | 26±23<br>52±25 | 412±116<br>289±165 | _ |
| Senden, P. Jeff, 2005 (14) | men:76.6% | NYHA II-III | 27±8% | 59.8±9.3 | 61 | 20.3±5.4<br>17.5±4.4 | _ | 29±8<br>28±10 | _ | _ | _ |
| Belardinelli, R., 2006 (15) | men:100% | NYHA II-III | 31±7% | 55±10 | 52 | 18.9±2.7<br>16.1±2.2 | 134±15<br>124±14 | _ | _ | _ | 110±25<br>85±20 |
| Dall'Ago, Pedro, 2006 (16) | men:65.6% | _ | 38.5±3% | 56±3 | 32 | 21±0.7<br>17±0.8 | _ | _ | 6±2<br>30±13 | 550±17<br>411±60 | _ |
| de Mello Franco, F. G., 2006 (17) | men:75.9% | NYHA II-III | 28±2.6% | 54±1.9 | 29 | 15.4±1.3<br>14.5±1.1 | _ | 30±1<br>29±2 | 39±6<br>42±5 | _ | _ |
| Dimopoulos, Stavros, 2006 (18) | men:95.8% | NYHA I-III | 32.1±10.6% | 60.5±9.4 | 24 | 16.4±3.8<br>16.6±4.9 | 133.0±21.0<br>118.0±16.0 | _ | _ | _ | 93.7±25.0<br>109.0±51.1 |
| Jónsdóttir, Sólrún, 2006 (19) | men:79.0% | NYHA II-III | 41±13.5% | 68.5±5.9 | 42 | 16.87±4.05<br>14.76±3.02 | 123.9±25.59<br>121.1±24.29 | 43.5±11.1<br>45.6±10.3 | _ | 526.4±71.9<br>494.6±66.4 | 104.1±27.68<br>95.9±30.36 |

**Table S3** (*continued*)



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**Table S3** (*continued*)

| Author, year | Sex | NYHA | LVEF at baseline (mean) | Age, years | N | Peak $VO_2$ mean ± SD (mL/kg/min) | HR MAX (beats/min) | LVEF(%) | MLHFQ | 6MWT(M) | Max workload (W) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | The data are in Table S2 from top to bottom G1-G2-G3-G4 | | | | | |
| Maria Sarullo, Filippo, 2006 (20) | men:75.5% | NYHA II-III | <40% | 52.7±5.3 | 60 | 17.7±2.6<br>15.1±1.2 | _ | 30.1±4<br>27.3±4 | _ | _ | 110±12<br>92±11 |
| Passino, Claudio, 2006 (21) | men:87.0% | NYHA I-III | 33.9±2.4% | 60.5±2.1 | 85 | 17±1<br>13±1 | _ | 38±2<br>31±2 | 32±4<br>53±5 | _ | 114±6<br>80±5 |
| Dracup, K., 2007 (22) | men:71.7% | NYHA II–IV | 26.4±6.8% | 54±12.5 | 173 | 13.4±4.0<br>13.8±4.1 | _ | _ | 35.7±23.7<br>43.2±27.3 | 433.7±107.99<br>422.33±96.71 | _ |
| Feiereisen, P., 2007 (23) | men:85% | NYHA II-III | 24.3±5.5% | 58.4±6.5 | 60 | 18.2±4.3<br>16±2.3<br>16.0±3.7<br>14.5±3.8 | _ | 28±8<br>32±7<br>30±10<br>27±9 | 18.5±4.7<br>18.3±8.0<br>17.9±7.2<br>21.7±10.7 | _ | 107.3±21.2<br>106.7±21.9<br>115.3±21.3<br>88.7±25.6 |
| Klecha, Artur, 2007 (24) | men:76% | NYHA II-III | 28±5.4% | 60.1±9.2 | 50 | 19.2±3.8<br>14.1±2.5 | 109±27<br>128±33 | 30.2±7.8<br>27.9±5.8 | _ | _ | 143.8±31.7<br>101.8±21.9 |
| Mueller, Lionel, 2007 (25) | men:100% | _ | <40% | 55±10 | 27 | 26.7±4.3<br>20.9±2.9 | 156.6±16<br>153.0±23 | _ | _ | _ | 172.9±48<br>139.8±32 |
| Myers, J., 2007 (26) | men:100% | _ | 33.1±5.7% | 55.5±6 | 24 | 24.8±4.7<br>18.8±4.6 | 151±24<br>139±16 | _ | _ | _ | 171.9±28<br>117.4±32 |
| Wisløff, Ulrik, 2007 (27) | men:74% | _ | 29±7.2% | 75.5±11 | 26 | 13.4±2.0<br>14.9±0.9<br>19.0±2.1 | 127±21<br>130±21<br>127±22 | 26.6±9.7<br>33.5±5.7<br>38.0±9.8 | _ | _ | _ |
| Beckers, Paul J., 2008 (28) | men:72.4% | NYHA II-III | 24.4±7% | 58.5±10.9 | 58 | 20.2±5.2<br>22.2±6.2 | 136±22<br>135±21 | 28.5±9.7<br>29.0±13.5 | _ | _ | 126.8±41<br>141.6±35.3 |
| Beer, M., 2008 (29) | - | _ | 27±10% | 55.5±9.7 | 22 | 25.3±5.2<br>20.8±2.7 | 155±17<br>157±19 | 36±14<br>28±15 | _ | _ | 164.2±48.8<br>137.5±36.5 |
| Giallauria, Francesco, 2008 (30) | men:72.1% | _ | 41.8±9.5% | 55.5±3.4 | 61 | 21.4±2.3<br>16.9±1.3 | 140.7±4.6<br>125.7±8.7 | 42.7±8.3<br>38.2±8.3 | _ | _ | 121.5±13.0<br>99.3±15.2 |
| Nilsson, B. B., 2008 (31) | men:78.8% | NYHA II-IIIB | 31±8.5% | 70.1±7.9 | 80 | _ | _ | _ | 22±12<br>23±20 | 515±93<br>440±100 | 85±26<br>72±19 |
| Passino, C., 2008 (32) | men:84.4% | NYHA I-III | 35.3±1.5% | 62±2 | 90 | 16.8±0.6<br>14.1±0.9 | _ | _ | _ | _ | 114±5<br>92±7 |
| Brubaker, Peter H., 2009 (33) | _ | NYHA II–IV | 30.7±9.0% | 70.2±5.1 | 59 | 13.9±0.8<br>13.6±0.7 | 142.2±3.5<br>129.3±4.2 | 29.4±1.8<br>29.1±2.3 | 35.3±4.2<br>37.9±4.3 | 462.05± 29.9<br>423.28± 23.8 | 58.4±6.1<br>51.2±7.3 |
| Jolly, K., 2009 (34) | men:74.6% | NYHA I-III | ≤40% | 68±12.6 | 157 | _ | _ | _ | 36.26±24.08<br>34.49±23.98 | _ | _ |
| Malfatto, G., 2009 (35) | men:72.2% | NYHA 2.3±0.9 | 32±5% | 65±10 | 54 | 17.1±3.2<br>14.2±4.2 | _ | 33±6<br>32±7 | _ | _ | _ |
| Mandic, Sandra, 2009 (36) | men:76.2% | NYHA I-III | 30.6±12% | 62±12 | 33 | 19.0±6.8<br>17.6±5.6<br>16.7±6.1 | _ | 33.2±12.6<br>35.4±10.1<br>28.4±9.2 | _ | _ | 101±41<br>96±34<br>82±41 |
| Munk, Peter S., 2009 (37) | men:82.5% | _ | 65±9% | 59±12.2 | 40 | 20.6±5.7<br>27.1±8 | 140±29<br>154±34 | _ | _ | _ | 174±69<br>202±46 |

**Table S3** (*continued*)


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**Table S3** (*continued*)

| Author, year | Sex | NYHA | LVEF at baseline (mean) | Age, years | N | Peak $VO_2$ mean ± SD (mL/kg/min) | HR MAX (beats/min) | LVEF(%) | MLHFQ | 6MWT(M) | Max workload (W) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Winkelmann, Eliane R., 2009 (38) | men:45.8% | _ | 36.5±11.5% | 56.5±10.7 | 24 | 19.7±4.1<br>19.2±4.2 | 135±33<br>142±24 | _ | 20±15<br>18±15 | 500±72<br>489±81 | _ |
| Davidson, Patricia M., 2010 (39) | men:61.9% | NYHA I-III | _ | 72.75 | 94 | _ | _ | _ | 27.92±12.46<br>36.89±16.22 | 361.20±132.34<br>274.98±106.60 | _ |
| Erbs, S., 2010 (40) | men:100% | NYHA IIIb | 24±2% | 61±10.4 | 37 | 17, 8±3.2<br>14.7±3.7 | _ | 33.5±5.7<br>23.7±4.8 | _ | _ | 94±23<br>69±26 |
| Jakovljevic, Djordje G., 2010 (41) | men:76.2% | NYHA I-II | 35±5.5% | 64±10 | 21 | 25.1±6.7<br>23.2±3.6 | _ | _ | _ | _ | _ |
| Kitzman, Dalane W., 2010 (42) | men:13.2% | NYHA II-III | 60.5±7.9% | 69.5±5.5 | 46 | 16.1±2.6<br>12.5±3.4 | 137±16<br>129±20 | 57±8<br>55±8 | 25±24<br>27±19 | 505.66±52.73<br>445.01±125.27 | 61±18<br>44±15 |
| Lima, Márcia M. O., 2010 (43) | men:57.5% | NYHA I-II | 36.3±7.8% | 49.5+7.8 | 37 | 33.8±7.6<br>33.6±4.2 | 140±31<br>135±18 | _ | _ | 601±83<br>535±76 | _ |
| Nilsson, Birgitta Blakstad, 2010 (44) | men:78.2% | NYHA II-IIIB | 30±8.6% | 70±8 | 78 | _ | _ | _ | 22±12<br>23±20 | 511±92<br>438±101 | 84±26<br>72±19 |
| Anagnostakou, V, 2011 (45) | men:82.1% | NYHA I-III | 37±12% | 53±10 | 28 | 18.3±6.3<br>17.2±3.7 | _ | _ | _ | _ | 116±47<br>120±25 |
| Bouchla, A, 2011 (46) | men:80% | NYHA I-III | 35.6±10.9% | 53.6±9.8 | 20 | 17.2±4.3<br>16.0±4.9 | _ | _ | _ | _ | 120±23<br>106±34 |
| Chien, C. L., 2011 (47) | men:75% | NYHA I-III | 40±13% | 58±16 | 44 | _ | _ | _ | 7±9<br>13±13 | 433±145<br>429±93 | _ |
| Edelmann, F., 2011 (48) | men:44% | NYHA II-III | 67±7% | 65±7 | 60 | 18.7±5.4<br>16.0±6.0 | _ | 66±6<br>67±8 | 17±17<br>21±19 | 569±88<br>568±80 | 129±41<br>111±41 |
| Maiorana, Andrew J., 2011 (49) | men:88.9% | NYHA I-III | 30.7±5.5% | 61.5±3.7 | 36 | 14.1±1.1<br>17.2±1.6<br>16.4±1.1 | 111±8<br>128±8<br>117±6 | 38±3<br>32±3<br>29±3 | _ | _ | _ |
| Belardinelli, R, 2012 (50) | men:78.0% | NYHA II-III | 37±8% | 59±14 | 123 | _ | _ | _ | 43±12<br>58±14 | _ | _ |
| Freyssin, C., 2012 (51) | men:50% | _ | 29.1±6.3 | 54±12 | 26 | 10.8±4.1<br>13.6±3.2 | _ | _ | _ | 451±72<br>475±52 | _ |
| Myers, Jonathan, 2012 (52) | men:100% | NYHA II-III | 33±6 | 55±6 | 50 | 19.9±3.75<br>25.2±5.0 | 149±19<br>152±21 | _ | _ | _ | 127±34<br>169 ±42 |
| Sandri, M, 2012 (53) | men:81.8% | NYHA II-III | 28±5 | 50±5 | 30 | 13.4±1.2<br>18.1±1.5 | _ | 28±2<br>34±2 | _ | _ | 66±1<br>86±2 |
| | men:80% | | | 72±5 | 30 | 13.3±2.1<br>17.1±1.1 | _ | 28±1<br>35±2 | _ | _ | 61±2<br>82+2 |
| Servantes, D. M., 2012 (54) | men:46.6% | NYHA II-III | 30±5 | 52±9.1 | 45 | 20.6±4.4<br>20.9±4.2<br>12.8±3.2 | _ | _ | 20.7±16.3<br>25.1±16.5<br>51.0±16.8 | _ | _ |
| Smart, NA, 2012 (55) | men:34.2% | NYHA I-II | 57±10 | 64±8 | 30 | 14.8±4.6<br>15±4.9 | 111±36<br>129±25 | 61.6±10.3<br>64±10 | _ | _ | 109±73<br>115±65 |

**Table S3** (*continued*)


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**Table S3** (*continued*)

| Author, year | Sex | NYHA | LVEF at baseline (mean) | Age, years | N | Peak $VO_2$ mean ± SD (mL/kg/min) | HR MAX (beats/min) | LVEF(%) | MLHFQ | 6MWT(M) | Max workload (W) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Smart, Neil., 2012 (56) | men:80% | NYHA II-III | 28±8 | 61.2±10 | 23 | 14±4<br>14.7±4.5 | 118±28<br>107±30 | 29.3±12.2<br>32.8±9.7 | 34.6±19.5<br>30.1±17.3 | _ | _ |
| Eleuteri, E., 2013 (57) | men:100% | NYHA II | 29±2.2% | 64.6±2.5 | 21 | 16±0.6<br>16.5±0.7 | _ | 31±2.5<br>28±2 | _ | _ | _ |
| Fu, Tieh-Cheng, 2013 (58) | men:68.8% | NYHA II-III | 38±4 | 67±2 | 45 | 16.1±1.4<br>16.0±1.5<br>19.6±1.2 | 135±11<br>138±12<br>143±5 | _ | 48.6±3.3<br>42.7±3.2<br>43.1±5.9 | _ | _ |
| Iellamo, F, 2013 (59) | men:100% | NYHA II-III | 32.15±6.5% | 62.4±8.2 | 16 | 22.5±3.1<br>23.0±4.3 | _ | _ | _ | _ | _ |
| Kitzman, DW, 2013 (60) | men:24% | NYHA II-III | 57±5.5% | 70±7 | 54 | 13.8±3.1<br>15.8±3.3 | 127 ± 17<br>132 ± 16 | 56±5<br>58±6 | 25±22<br>26±19 | _ | 67±27<br>89±30 |
| Laoutaris, ID, 2013 (61) | men:81.5% | NYHA II-III | 29±7 | 58±9 | 27 | 19.5±4.1<br>19.6±6.2 | <br>141±17<br>134±21 | 33.4±5.7<br>30.4±8.2 | 37.8±7<br>33.7±3.2 | _ | _ |
| Mehani, S. H., 2013 (62) | men:100% | NYHA II-III | 34.4±6.0% | 55.5±7.7 | 30 | 17.48±2.24<br>21.08±5.47 | 134.07±14.25<br>126.8 ± 12.34 | 37.27±7.82<br>48.93±8.38 | _ | _ | _ |
| Mezzani, A., 2013 (63) | men:100% | NYHA I-III | 29±6.1% | 64±7 | 30 | 16.1±2.1<br>17.1±2.7 | 122±18<br>116±15 | _ | _ | _ | _ |
| Adamopoulos, S, 2014 (64) | men:83.7% | NYHA I-III | 28.9±5.9% | 58.1±15 | 43 | 18.9±5.3<br>20.2±5.5 | 129±24<br>138±23 | 36±11<br>36±9 | 27.7±11.3<br>38.8±8.4 | _ | _ |
| Antunes-Correa, L. M., 2014 (65) | men:80.1% | NYHA II-III | 28.5±1.6% | 55±2.2 | 34 | 17±1<br>21±1 | _ | 31±2<br>32±3 | _ | _ | _ |
| Chrysohoou, C, 2014 (66) | men:80% | NYHA II-IV | 31 | 59±10 | 72 | 18±4<br>21±5 | _ | _ | 21±13<br>7±9 | 423±65<br>476±82 | _ |
| de Meirelles, LR, 2014 (67) | men:50% | _ | 31±2 | 54±3 | 30 | 18.3±1<br>23.8±0.5 | 143.3±4.9<br>132.9±5.8 | _ | _ | _ | _ |
| Georgantas, A, 2014 (68) | men:83.3% | NYHA I-III | 34±10 | 54±10 | 42 | 18.6±5.9<br>17.9±4.7 | _ | _ | _ | _ | _ |
| Koufaki, P., 2014 (69) | men:81.8% | NYHA I-III | 38.4±9% | 59.7±9.2 | 17 | 18.9±7.5<br>17.7±4.9 | _ | _ | 37±24<br>33.3±17.6 | _ | _ |
| Palau, P, 2014 (70) | men:50% | NYHA II | 73±5 | 71±7 | 26 | 8.76±3.01<br>12.7±3.29 | 109±18<br>122±28 | 75.5±10.5<br>66.3±9.4 | 39.4±23<br>30±8.3 | 273±141<br>386±64 | _ |
| Angadi, S. S., 2015 (71) | men:80% | NYHA II-III | 65.6±4.2 | 70±8 | 15 | 16.8±4.0<br>21±5.2 | 127±21<br>130±18 | _ | _ | _ | _ |
| Benda, NM, 2015 (72) | men:82.8% | NYHA II-III | 37.5±5.9% | 63.5±7.8 | 20 | 21.3±3.7<br>20.4±4.1 | 132±24<br>125±15 | 36±5<br>36±9 | 16±16<br>20±14 | _ | 152±26<br>142±45 |
| Groehs, R. V., 2015 (73) | men:84.5% | NYHA II-III | 28±3.2% | 53±5 | 26 | 19±1<br>20±1 | | _ | _ | _ | _ |
| Kim, C., 2015 (74) | men:78.6% | _ | 53.7±12.64% | 58.6±12.5 | 28 | 29.6±8.7<br>35.6±7.7 | 144.9±22.6<br>154.2±15.7 | _ | _ | _ | _ |

**Table S3** (*continued*)


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**Table S3** (*continued*)

| Author, year | Sex | NYHA | LVEF at baseline (mean) | Age, years | N | Peak $VO_2$ mean ± SD (mL/kg/min) | HR MAX (beats/min) | LVEF(%) | MLHFQ | 6MWT(M) | Max workload (W) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nolte, K, 2015 (75) | men:44% | NYHA II-III | >50 | 65±7 | 44 | _ | _ | _ | 17±17<br>21±19 | _ | _ |
| Piotrowicz, E., 2015 (76) | men:91% | NYHA II-III | 31.2±7.7 | 57±12 | 107 | 17.2±3.4<br>18.4±4.1 | 117±14<br>122±18 | _ | _ | 465±91<br>480±87 | _ |
| Smolis-Bąk, E., 2015 (77) | men:90.4% | NYHA III | 25±7 | 62±9 | 52 | 13.4±4.2<br>17.2±3.9 | _ | _ | _ | _ | _ |
| Stevens, A. L., 2015 (78) | men:76.5% | NYHA I-III | 37.7±3.2 | 66±4 | 22 | 16.9±3.1<br>18.1±1.1 | _ | _ | _ | _ | _ |
| Yaylalı, YT, 2015 (79) | men:85% | NYHA II-III | 30%-45% | 61.3±8.4 | 41 | 11±5<br>17±7<br>14±3 | 113±16<br>117±16<br>112±14 | _ | _ | _ | _ |
| Acanfora, D, 2016 (80) | men:66.7% | NYHA II-III | 32.9±7.3% | 63.2±9.4 | 72 | 15.8±0.81<br>12.54±0.81 | 123 ± 17<br>116 ± 27 | _ | _ | _ | _ |
| Antonicelli, R, 2016 (81) | men:56.9% | _ | 48.4±13.4% | 76.90±5.67 | 313 | _ | | | 44.5±12.3<br>28.6±12.3 | _ | _ |
| Höllriegel, R, 2016 (82) | men:100% | NYHA IIIb | 24.5±1.1% | 60±2.5 | 23 | 14.9±0.8<br>19.5±0.9 | _ | 31.3±3.0<br>38.4±2.0 | _ | _ | 84±8<br>111±6 |
| Kitzman, D. W., 2016 (83) | men:19% | NYHA II-III | 61±6 | 67±5 | 100 | 28.2±1<br>30.3±1 | _ | _ | 19±4<br>18±4 | _ | _ |
| Safiyari-Hafizi, H, 2016 (84) | - | _ | _ | _ | 40 | 9.4±2.4<br>11.2±2.9 | 86±24<br>95±22 | _ | _ | _ | _ |
| Ellingsen, Ø, 2017 (85) | men:81.3% | NYHA II-III | 29.34% | 61.8 | 215 | 17.6±3.1<br>17.4±2.9<br>18.1±2.8 | _ | 28.3±2.3<br>27.7±4.5<br>30.2±1.5 | _ | _ | _ |
| Hwang, R., 2017 (86) | men:75% | NYHA I-III | 35±17 | 67±12 | 53 | _ | _ | _ | 35±24<br>32±19 | 394±119<br>364±96 | _ |
| Maldonado-Martín, S., 2017 (87) | men:12.8% | _ | >50 | >65 | 47 | 12.6±3.4<br>16±2.6 | 129±20<br>138±16 | _ | _ | 430±125<br>506±53 | 47.3±19.2<br>59.8±19.9 |
| Villelabeitia Jaureguizar, K., 2017 (88) | men:85% | _ | 60.5±12.6% | 58 ± 11 | 73 | 22.8±6.5<br>23.9±4.9 | 118.53±20.61<br>125.92±14.04 | _ | _ | _ | _ |
| Chen, DM, 2018 (89) | men:52.5% | NYHA I-II | 58.61± 15.56% | 70.3±13.5 | 63 | _ | _ | _ | 20.33±12.35<br>15.40±11.74 | _ | _ |
| Chen, YW, 2018 (90) | men:83.8% | NYHA I-III | 34±10 | 61±13 | 37 | 16.5±3.7<br>20.9±6.6 | _ | _ | 42.1±14.0<br>20.2±8.6 | 344±121<br>462±74 | _ |
| Doletsky, A, 2018 (91) | men:91.3% | NYHA I-III | 29±9 | 61±12 | 46 | 14.1±4.8<br>17.4±4.3 | _ | 31.6±8.9<br>34.5±10.4 | 42.9±20.8<br>23.7±9.1 | 399.2±95.0<br>494.3±144.2 | _ |
| Munch, GW, 2018 (92) | men:84.6% | NYHA I-II | ≤40% | 61±3.6 | 26 | 21±1<br>25±1 | 125±5<br>131±7 | _ | 13±3<br>11±3 | 599±20<br>577±22 | 140±11<br>145±10 |
| Peng, X., 2018 (93) | men:59.2% | NYHA I-III | 34±6 | 66±10 | 83 | _ | _ | 34.14±6.65<br>34.08±6.61 | 49.6±12.4<br>42.3±8.8 | 406.38±12.57<br>418.25±9.68 | _ |

**Table S3** (*continued*)


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**Table S3** (*continued*)

| Author, year | Sex | NYHA | LVEF at baseline (mean) | Age, years | N | Peak $VO_2$ mean ± SD (mL/kg/min) | HR MAX (beats/min) | LVEF(%) | MLHFQ | 6MWT(M) | Max workload (W) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Servantes, DM, 2018 (94) | men:61.8% | NYHA II-III | 30±6 | 54±9 | 35 | 14±3<br>20±4 | 113±19<br>121±19 | _ | 49±21<br>24±18 | _ | _ |
| Tanaka, Y, 2018 (95) | men:100% | NYHA I-II | 52±16 | 61±11 | 30 | 18.1±3.5<br>22.1±3.7 | _ | _ | _ | _ | _ |
| Besnier, F, 2019 (96) | men:71% | NYHA I-III | 36±7.4% | 59.2±12.3 | 31 | 15.7±5.1<br>20.2±5.8 | _ | 36.9±8<br>39.5±8.5 | _ | _ | _ |
| Chou, CH, 2019 (97) | men:71.9% | NYHA II-III | 35.4±5.1% | 60.3±5.1 | 34 | 16.0±3.4<br>24.7±3.2 | 136±8<br>142±6 | 36.5±6.4<br>48.9±6.5 | 35.5±4.8<br>22.2±5.0 | _ | _ |
| Prince, SA, 2019 (98) | - | _ | _ | _ | 60 | 17.7±1.2<br>13.0±1.7 | _ | _ | 19.6±3.2<br>20.8±3.0 | 511.2±21.0<br>490.4±20.7 | _ |
| Schertz, A, 2019 (99) | men:54% | NYHA I-III | 61±4 | 73±5 | 14 | 19.9±4.9<br>19.6±4.9 | _ | _ | _ | 556.9±85.8<br>516.8±93.4 | _ |
| Donelli da Silveira, A, 2020 (100) | men:37% | NYHA II-III | 65±5% | 60±9 | 19 | 19.5±3.7<br>19.6±3.5 | 140±28<br>127±23 | 65±5<br>66±4 | 24±13<br>18±12 | _ | _ |
| Lan, NSR, 2020 (101) | men:84.2% | NYHA I-III | 31±5.9% | 61.5±3.7 | 36 | 14.1±1.1<br>17.2±1.6<br>16.4±1.1 | _ | 39±3<br>32±4<br>29±3 | _ | _ | _ |
| Turri-Silva, N, 2021 (102) | men:72.7% | NYHA I-II | 46±15 | 56±10 | 22 | 20.1±4.2<br>19.9±3.4<br>19.6±4.9 | 139.9±14.5<br>129.2±9.9<br>129.4±20.5 | _ | _ | _ | _ |
| Austin, J.k, 2005 (103) | men:43% | NYHA II-III | <40% | _ | 179 | _ | _ | _ | 36.9±2.4<br>22.9±1.8 | _ | _ |
| Roveda, F., 2003 (104) | men:66.7% | NYHA II-III | 35±3 | 63±5 | 16 | 20.6±3<br>17.5±2 | _ | 34±2<br>35±2 | _ | _ | _ |
| Linke, Axel, 2015 (105) | men:100% | NYHA II-III | 26±3 | 54±3 | 23 | 23.7±1.4<br>17.8±1.2 | _ | _ | _ | _ | _ |
| Laoutaris, Ioannis D., 2007 (106) | men:84.2% | NYHA II-III | 28±1 | 57±2 | 38 | 19.4±1.2<br>14.8±0.8 | 134±6<br>132±6 | _ | _ | 404.3±11.9<br>366±16.5 | _ |
| Roditis, Petros, 2007 (107) | men:89.7% | NYHA I-III | 32±11 | 61±8 | 21 | 16.6±4.5<br>15.4±4.2 | 134.4±21.0<br>119.5±17.5 | _ | _ | _ | 94.7±46.1<br>93.7±30.1 |
| Babu, A. S., 2011 (108) | men:76.7% | NYHA II-IV | 30±10 | 58±11 | 30 | _ | _ | _ | _ | 514.53±135.12<br>357.15±147.95 | _ |
| Caminiti, G, 2011 (109) | men:100% | NYHA II-III | 33±10 | 68±7 | | _ | _ | _ | _ | 364±41<br>327±38 | _ |
| Gary, R. A., 2011 (110) | men:50% | NYHA II-III | 25±9 | 60±10 | 24 | _ | _ | _ | 33.5±22.9<br>46.5±19.7 | 410.7±91.5<br>309.7±135.4 | _ |
| Haykowsky, M. J., 2012 (111) | men:12% | NYHA II-III | _ | 69±6 | 40 | 16.3±2.6<br>13.1±3.4 | 139±16<br>131±20 | _ | _ | _ | _ |
| Norman, J. F., 2012 (112) | men:57.5% | NYHAII-IV | 33±1 | 60±5 | 40 | _ | _ | _ | _ | 463.0±63.0<br>384.6±91.7 | _ |

**Table S3** (*continued*)


https://dx.doi.org/10.21037/cdt-2024-698

**Table S3** (*continued*)

| Author, year | Sex | NYHA | LVEF at baseline (mean) | Age, years | N | Peak $VO_2$ mean ± SD (mL/kg/min) | HR MAX (beats/min) | LVEF(%) | MLHFQ | 6MWT(M) | Max workload (W) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fayazi, S., 2013 (113) | men:90.1% | NYHA II-III | 31±7 | 61±9 | 60 | _ | _ | _ | 43.80±6.77<br>52.50±7.32 | 412.30±70.51<br>377.63±72.55 | _ |
| Iellamo, Ferdinando, 2013 (114) | men:100% | NYHA II-III | <40 | 62±9 | | 22.53±3.13<br>23.02±4.28 | 128±8<br>124±13 | 32.1±5.19<br>34.57±5.56 | _ | _ | _ |
| Hassanpour Dehkordi, A., 2015 (115) | men:30.6% | NYHA II-III | 33±5 | 59±4 | 61 | _ | _ | 37±5<br>31±5 | _ | _ | _ |
| Banks, AZ, 2016 (116) | men:72.3% | NYHA II-IV | 35 | 60 | 1, 581 | 0.9±2.6<br>0.2±2.6 | _ | _ | _ | 25.2±74.0<br>2.9±69.5 | _ |
| Tzanis, G., 2017 (117) | men:100% | NYHA I-III | 21±5 | 51±13 | 13 | 24.4±5.4<br>21.5±4.4<br>20.8±6.9 | _ | _ | _ | _ | 171±56<br>149±40<br>110±58 |
| Iliou, MC, 2018 (118) | men:89% | NYHA II-III | 30±7 | 62±10 | 138 | 16.3±5.7<br>17.2±5.7 | 112±25<br>115±25 | _ | _ | 439±130<br>464±120 | 90±39<br>99±38 |
| Oliveira, MF, 2018 (119) | men:77% | NYHA IV | 25±6 | 57±5 | 28 | _ | _ | _ | _ | 345±61<br>311±67<br>266±83 | _ |
| Dalal, HM, 2019 (120) | men:78.5% | NYHA I-III | 34 | 70±11 | 216 | _ | _ | _ | 24.1±20.9<br>27.5±23.2 | _ | _ |
| Palau, P, 2019 (121) | men:42% | NYHA II-III | 67±10 | 74±9 | 28 | 12.6±3.4<br>8.8±2.6 | _ | _ | 27.8±14.8<br>42.6±21.8 | _ | _ |
| Yeh, GY, 2011 (122) | men:64% | NYHA I-III | 29±8 | 67±11 | 100 | 12.6±3.8<br>13.3±5.3 | _ | 12.2±15.6<br>23.1±30 | _ | 402±169<br>411±140 | _ |


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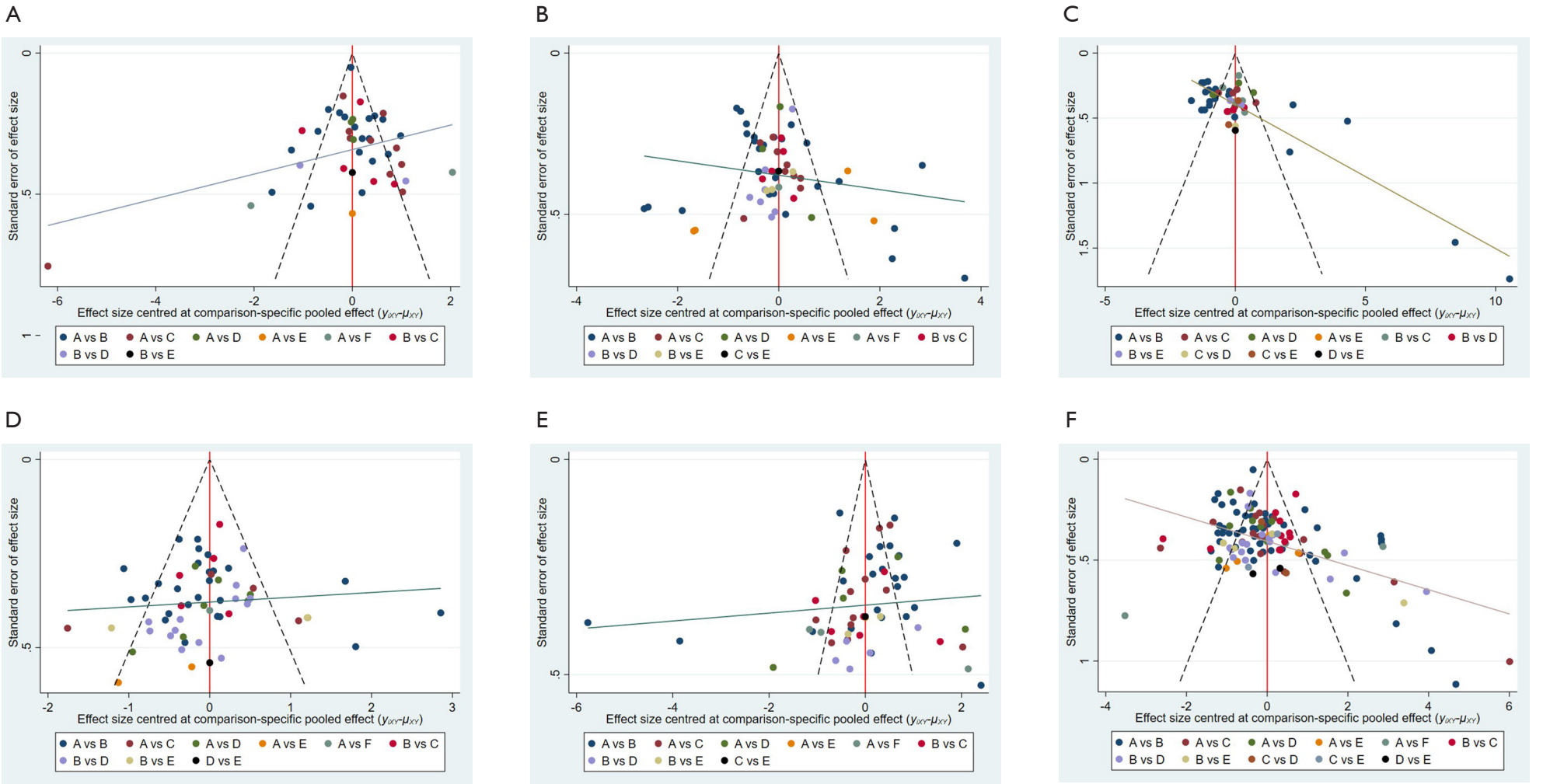


**Figure S1** Publication bias funnel plot in various outcome. (A) Control; (B) aerobic training; (C) combine training; (D) HIIT; (E) strength training; (F) IMT. (A) Publication bias funnel plot in 6MWT outcome. (B) Publication Bias Funnel Plot in LVEF outcome. (C) Publication bias funnel plot in Max_workload outcome. (D) Publication Bias funnel plot in MHR outcome. (E) Publication bias funnel plot in MLHFQ outcome. (F) Publication bias funnel plot in peak $VO_2$ outcome. 6MWT, six-minute walk test; HIIT, high-intensity interval training; IMT, inspiratory muscle training; MHR, maximum heart rate; MLHFQ, Minnesota Living with Heart Failure Questionnaire; LVEF, left ventricular ejection fraction.


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**Table S4** Pairwise Analysis of training and outcome (SMD&WMD)

| Analysis | Outcome | Number of studies included | Effect (WMD) | P value | $I^2$ | Model | Effect (SMD) | P value | $I^2$ | Model |
|---|---|---|---|---|---|---|---|---|---|---|
| Aerobic training VS Control | 6MWT (m) | 18 | 33.14 (19.29, 47.00) | 0.0001 | 80.7 | random | 0.65 (0.33, 0.96) | 0.001 | 80.7 | random |
| | Peak $VO_2$ (ml/kg/min) | 47 | 2.49 (1.93, 3.04) | 0.0001 | 93.2 | random | 1.15 (0.86, 1.42) | 0.001 | 91.4 | random |
| | LVEF (%) | 22 | 2.97 (1.00, 4.93) | 0.003 | 93.3 | random | 0.64 (0.22, 1.01) | 0.03 | 90 | random |
| | MLHFQ (score) | 21 | -7.52 (-12.09, -2.95) | 0.001 | 95.8 | random | -0.72 (-1.11, -0.32) | 0.001 | 92.5 | random |
| | Max_workload | 22 | 21.41 (20.53, 22.30) | 0.001 | 90.1 | random | 1.15 (1.00, 1.29) | 0.001 | 91.4 | random |
| | MHR (beats/min) | 21 | 6.72 (3.50, 9.94) | 0.001 | 67.7 | random | 0.53 (0.19, 0.86) | 0.001 | 82.1 | random |
| HIIT VS Control | Peak $VO_2$ (ml/kg/min) | 14 | 3.91 (2.58, 5.23) | 0.001 | 84.3 | random | 1.18 (0.71, 1.65) | 0.001 | 84.1 | random |
| | 6MWT (m) | 3 | 65.30 (40.16, 90.45) | 0.001 | 0 | fix | 0.75 (0.46, 1.04) | 0.001 | 0 | fix |
| | LVEF (%) | 4 | 6.68 (0.57, 12.80) | 0.032 | 88.5 | random | 1.03 (0.44, 1.62) | 0.001 | 71.2 | random |
| | MLHFQ (score) | 5 | -10.34 (-15.50, -5.18) | 0.001 | 84.7 | random | -1.35 (-2.17, -0.16) | 0.001 | 88.4 | random |
| | Max_workload | 3 | 22.89 (-0.05, 45.81) | 0.05 | 43.4 | random | 0.57 (0.23, 0.92) | 0.001 | 0 | fix |
| | MHR (beats/min) | 7 | 5.65 (2.39, 8.91) | 0.001 | 0 | fix | 0.36 (0.09, 0.63) | 0.01 | 31.9 | fix |
| Combine training VS Control | Peak $VO_2$ (ml/kg/min) | 18 | 2.99 (1.89, 4.10) | 0.001 | 90.1 | random | 1.21 (0.72, 1.69) | 0.001 | 88.4 | random |
| | 6MWT (m) | 8 | 49.02 (1.91, 96.12) | 0.041 | 78.4 | random | 0.44 (0.01, 0.87) | 0.045 | 71.3 | random |
| | LVEF (%) | 9 | 1.62 (0.20, 3.04) | 0.026 | 64.6 | random | 0.40 (0.07, 0.73) | 0.018 | 56.8 | random |
| | MLHFQ (score) | 11 | -7.26 (-11.55, -2.97) | 0.001 | 67.8 | random | -0.52 (-0.83, -0.21) | 0.001 | 65.4 | random |
| | Max_workload | 6 | 18.05 (8.93, 27.17) | 0.001 | 0 | fix | 0.52 (0.23, 0.80) | 0.001 | 0 | fix |
| | MHR (beats/min) | 5 | 2.20 (-8.89, 13.30) | 0.697 | 87.4 | random | 0.09 (-0.20, 0.37) | 0.561 | 81.9 | random |
| Strength training VS Control | Peak $VO_2$ (ml/kg/min) | 3 | 1.84 (0.16, 3.51) | 0.031 | 74.7 | random | 1.07 (0.11, 2.03) | 0.029 | 70 | random |
| | LVEF (%) | 3 | -1.19 (-9.24, 6.85) | 0.771 | 96.4 | random | -0.44 (-2.67, 1.80) | 0.702 | 93.6 | random |

The studies included in this analysis can be found in *Table S14*.


https://dx.doi.org/10.21037/cdt-2024-698

**Table S5** Studies included in the pairwise analysis of primary exercise modes

| Outcome | Type of Exercise | Reference of the studies included |
|---|---|---|
| $VO_2$ | AT | (1,2,6,7,8,9,12,13,15,20,21,23,24,25,26,27,29,30,32,33,35,36,40,42,43,49,54,55,58,60,62,63,73,76,79,80,82,83,85,87,90,99,101,106,111,116,122) |
| | CT | (10,11,14,17,19,22,23,36,48,54,65,67,77,78,84,94,104,117) |
| | HIIT | (4,27,37,52,53,58,66,79,85,91,95,97,102,117) |
| | ST | (3,23,49) |
| LVEF | AT | (1,20,21,23,24,27,29,33,35,36,40,42,49,53,55,60,62,82,85,93,101,115) |
| | CT | (11,14,17,19,23,36,48,65,104) |
| | HIIT | (27,85,91,97) |
| | ST | (3,23,49) |
| 6MWT | AT | (5,6,8,9,12,13,31,33,42,43,76,86,87,90,93,99,106,122) |
| | CT | (19,34,39,47,48,108,110,112) |
| | HIIT | (44,66,91) |
| MLHFQ | AT | (5,8,12,13,21,23,31,33,42,50,54,58,60,81,83,86,89,90,93,120,122) |
| | CT | (10,17,23,34,39,47,48,54,75,94,110) |
| | HIIT | (44,58,66,91,97) |
| MHR | AT | (1,2,6,12,15,25,26,27,29,30,33,49,55,58,62,63,76,79,80,87,111) |
| | CT | (10,19,67,84,94) |
| | HIIT | (27,37,52,58,79,97,102) |
| MAX_ Workload | AT | (6,9,15,20,21,23,24,25,26,29,30,31,32,33,36,40,42,53,55,60,82,117) |
| | CT | (11,19,23,36,48,117) |
| | HIIT | (37,44,117) |


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**Table S6** Pairwise Analysis of training and outcome in different training duration (WMD)

| Analysis | Outcome | Time | Number of studies included | Effect (WMD) | $I^2$ | Model |
|---|---|---|---|---|---|---|
| Aerobic training VS Control | 6MWT (m) | ≤12 weeks | 9 | 16.8 (-2.37, 35.96) | 69.6 | random |
| | | >12 weeks | 9 | 53.76 (29.33, 78.19) | 84.5 | random |
| | Peak $VO_2$ (ml/kg/min) | ≤12 weeks | 17 | 1.82 (0.87, 2.78) | 89.9 | random |
| | | 12-24weeks | 18 | 1.84 (1.24, 2.43) | 93.8 | random |
| | | >24weeks | 12 | 4.07 (3.20, 4.94) | 88.6 | random |
| | LVEF (%) | ≤12 weeks | 7 | 1.57 (-2.99, 6.14) | 95.9 | random |
| | | 12-24weeks | 9 | 2.59 (0.872, 4.326) | 63 | random |
| | | >24weeks | 6 | 4.83 (1.99, 7.67) | 85 | random |
| | MLHFQ (score) | ≤12 weeks | 8 | -6.53 (-11.04, -2.03) | 70.1 | random |
| | | 12-24weeks | 9 | -5.06 (-10.67, 0.54) | 92.5 | random |
| | | >24weeks | 4 | -11.95 (-19.06, -4.83) | 94.3 | random |
| | HR MAX (beats/min) | ≤12 weeks | 7 | 6.29 (0.87, 11.71) | 53.5 | random |
| | | 12-24weeks | 8 | 7.13 (1.04, 13.23) | 55 | random |
| | | >24weeks | 6 | 6.37 (-0.86, 13.61) | 82.2 | random |
| HIIT VS Control | Peak $VO_2$ (ml/kg/min) | ≤12 weeks | 8 | 3.99 (2.17, 5.80) | 90.6 | random |
| | | >12 weeks | 6 | 3.65 (2.44, 4.85) | 40.6 | fix |
| Combine training VS Control | Peak $VO_2$ (ml/kg/min) | ≤12 weeks | 4 | 2.38 (0.61, 4.16) | 72.8 | random |
| | | >12 weeks | 14 | 3.21 (1.80, 4.62) | 91.7 | random |


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**Table S7** Pairwise Analysis of subgroup training and outcome (SMD&WMD)

| Peak $VO_2$ | | | | | | | |
|---|---|---|---|---|---|---|---|
| Type of Exercise | Exercise (*vs.* Control) | Effect (SMD) | P value | SCURA% | Effect (WMD) (ml/kg/min) | P value | SCURA% |
| Aerobic | bicycle | **1.35 (0.91, 1.80)** | <0.0001 | 72.3 | **2.93 (2.09, 3.76)** | <0.0001 | 66.8 |
| | walking | **0.91 (0.15, 1.68)** | 0.019 | 47.3 | **2.35 (0.80, 3.89)** | 0.003 | 50.5 |
| | running | **1.43 (0.17, 2.70)** | 0.026 | 72.2 | 2.41 (-0.31, 5.13) | 0.082 | 52.3 |
| | combine aerobic | **1.16 (0.65, 1.68)** | <0.0001 | 61 | **2.64 (1.60, 3.68)** | <0.0001 | 58.8 |
| | other aerobic | 0.50 (-0.89, 1.89) | 0.483 | 33.2 | 1.08 (-2.00, 4.16) | 0.491 | 27.2 |
| Combine | aerobic+strength | **0.62 (0.10, 1.14)** | 0.018 | 32.4 | **1.23 (0.19, 2.26)** | 0.02 | 24 |
| | aerobic+IMT | 1.12 (-0.32, 2.56) | 0.128 | 57.5 | 2.13 (-1.10, 5.37) | 0.196 | 47.6 |
| | strength+IMT | 0.76 (-0.93, 2.47) | 0.378 | 44.2 | 2.52 (-0.85, 5.89) | 0.143 | 55.1 |
| | strength+HIIT | 1.14 (-0.55, 2.84) | 0.186 | 57.9 | 3.07 (-0.37, 6.52) | 0.081 | 64.9 |
| 6MWT | | | | | | | |
| Type of Exercise | Exercise (*vs.* Control) | Effect (SMD) | P value | SCURA% | Effect (WMD) (m) | P value | SCURA% |
| Aerobic | bicycle | 0.98 (-0.13, 2.10) | 0.086 | 75 | 74.00 (-23.64, 171.64) | 0.137 | 72.5 |
| | walking | 0.21 (-0.75, 1.18) | 0.666 | 42.5 | 6.24 (-79.00, 91.50) | 0.886 | 35.3 |
| | running | 1.04 (-1.09, 3.19) | 0.337 | 70.4 | 11.87 (-173.5, 197.59) | 0.9 | 42.5 |
| | combine aerobic | 0.40 (-0.29, 1.10) | 0.256 | 51.6 | 30.98 (-30.66, 92.63) | 0.325 | 51.4 |
| | other aerobic | 0.37 (-1.16, 1.90) | 0.636 | 48.7 | 51.66 (-91.98, 195.30) | 0.481 | 59.9 |
| Combine | aerobic+strength | -0.06 (-0.66, 0.54) | 0.843 | 27.5 | 1.37 (-51.44, 54.19) | 0.959 | 31.2 |
| | aerobic+IMT | 0.92 (-0.65, 2.50) | 0.251 | 69.6 | 67.98 (-67.82, 203.80) | 0.327 | 67 |
| HR MAX | | | | | | | |
| Type of Exercise | Exercise (*vs.* Control) | Effect (SMD) | SCURA% | P value | Effect (WMD) (beats/min) | SCURA% | P value |
| Aerobic | bicycle | 0.30 (-0.05, 0.67) | 59.5 | 0.099 | **4.34 (0.07, 8.60)** | 64.1 | 0.046 |
| | walking | 0.20 (-0.41, 0.82) | 48.1 | 0.516 | 3.06 (-4.90, 11.04) | 51.7 | 0.451 |
| | running | 0.34 (-0.66, 1.34) | 57.9 | 0.509 | 4.63 (-8.04, 17.31) | 59.5 | 0.474 |
| | combine aerobic | **0.57 (0.13, 1.02)** | 83.2 | 0.011 | **6.05 (0.86, 11.24)** | 77.7 | 0.022 |
| Combine | aerobic+strength | 0.12 (-0.43, 0.69) | 40 | 0.655 | 2.27 (-4.19, 8.74) | 46.1 | 0.491 |
| | aerobic+IMT | 0.31 (-0.60, 1.23) | 56 | 0.519 | 0.84 (-12.07, 13.76) | 39.5 | 0.898 |

**Table S7** (*continued*)


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**Table S7** (*continued*)

| LVEF | | | | | | | |
|---|---|---|---|---|---|---|---|
| Type of Exercise | Exercise (*vs.* Control) | Effect (SMD) | P value | SCURA% | Effect (WMD) (%) | P value | SCURA% |
| Aerobic | bicycle | **1.05 (0.57, 1.54)** | <0.0001 | 91.7 | **4.06 (2.32, 5.80)** | <0.0001 | 71.9 |
| | walking | 0.70 (-0.42, 1.83) | 0.219 | 75.4 | 4.02 (-0.67, 8.72) | 0.093 | 80 |
| | running | 0.25 (-0.96, 1.47) | 0.681 | 54.7 | 1.25 (-3.35, 5.86) | 0.593 | 34.4 |
| | combine aerobic | 0.012 (-0.55, 0.57) | 0.966 | 42.6 | 0.29 (-3.35, 5.86) | 0.793 | 50.6 |
| Combine | aerobic+strength | 0.08 (-0.47, 0.65) | 0.755 | 47.2 | 0.88 (-1.40, 3.17) | 0.45 | 57.7 |
| | aerobic+IMT | -1.88 (-1.64, 1.26) | 0.8 | 36.8 | -1.29 (-7.54, 4.96) | 0.686 | 36.7 |
| MLHFQ | | | | | | | |
| Type of Exercise | Exercise (*vs.* Control) | Effect (SMD) | P value | SCURA% | Effect (WMD) (score) | P value | SCURA% |
| Aerobic | bicycle | **-1.74 (-2.59, -0.89)** | <0.0001 | 89.7 | **-9.33 (-16.17, -2.49)** | 0.007 | 72.7 |
| | walking | -0.66 (-1.77, 0.43) | 0.238 | 50.8 | -5.89 (-15.04, 3.26) | 0.207 | 53.6 |
| | running | -0.49 (-1.95, 0.96) | 0.505 | 43.1 | -3.68 (-15.37, 8.00) | 0.537 | 42.6 |
| | combine aerobic | -0.40 (-1.30, 0.49) | 0.376 | 39.3 | -3.30 (-10, 67, 4.05) | 0.379 | 38.9 |
| | other aerobic | -0.62 (-2.05, 0.79) | 0.389 | 49.3 | -12.14 (-24.68, 0.40) | 0.058 | 79.7 |
| Combine | aerobic+strength | -0.13 (-0.77, 0.51) | 0.69 | 26.7 | -1.16 (-6.52, 4.20) | 0.671 | 26 |
| | aerobic+IMT | -1.48 (-3.09, 0.12) | 0.071 | 77.2 | -10.77 (-23.84, 2.29) | 0.106 | 74.6 |
| MAX_Workload | | | | | | | |
| Type of Exercise | Exercise (*vs.* Control) | Effect (SMD) | P value | SCURA% | Effect (WMD) (W) | P value | SCURA% |
| Aerobic | bicycle | **2.12 (1.28, 2.96)** | <0.0001 | 92.2 | **21.50 (16.87, 26.15)** | <0.0001 | 81.9 |
| | walking | 0.48 (-2.77, 3.73) | 0.771 | 38.8 | 12.80 (-6.10, 31.87) | 0.186 | 41.1 |
| | combine aerobic | 0.92 (-0.26, 2.11) | 0.127 | 48.2 | **17.28 (9.06, 25.50)** | <0.0001 | 55.6 |
| Combine | aerobic+strength | 0.78 (-0.24, 1.80) | 0.135 | 42.4 | **15.48 (7.47, 23.48)** | <0.0001 | 45.2 |


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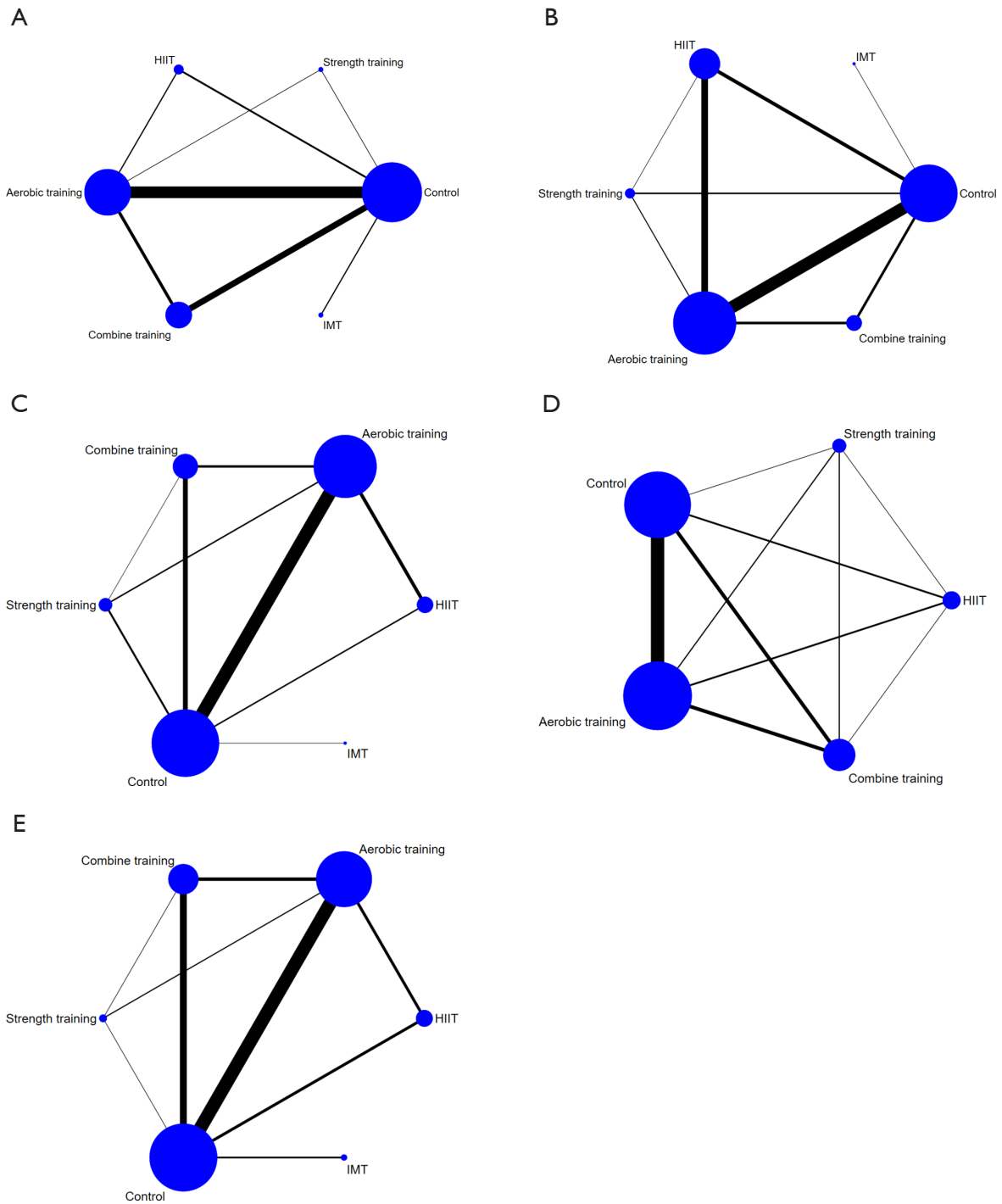


**Figure S2** Network diagrams for various outcome. (A) Network diagrams for 6MWT. (B) Network diagrams for MHR. (C) Network diagrams for LVEF. (D) Network diagrams for Max_workload. (E) Network diagrams for MLHFQ score. HIIT, high-intensity interval training; IMT, inspiratory muscle training.


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**Table S8** Primary training Bayesian table of rank probabilities and surface under the cumulative ranking

| Peak $VO_2$ | | | | | | | 6MWT | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rank | Control | Aerobic | Combine | HIIT | Strength | IMT | Rank | Control | Aerobic | Combine | HIIT | Strength | IMT |
| Best | 0 | 2.4 | 0.3 | 61.5 | 31.8 | 4 | Best | 0 | 0.5 | 0.5 | 46.1 | 9 | 43.8 |
| 2nd | 0 | 31.4 | 3.5 | 31.3 | 30.6 | 3.2 | 2nd | 0.3 | 12.9 | 5.5 | 41.1 | 17.7 | 22.5 |
| 3rd | 0 | 53.2 | 15.5 | 5.9 | 21.5 | 4 | 3rd | 3.4 | 39.9 | 17.9 | 9.4 | 19.7 | 9.6 |
| 4th | 0.1 | 12.1 | 66 | 1.2 | 13.2 | 7.4 | 4th | 19 | 33.9 | 29.3 | 2 | 10.2 | 5.6 |
| 5th | 50 | 0.9 | 14.7 | 0.1 | 2.9 | 31.4 | 5th | 42.6 | 11.1 | 28.5 | 0.9 | 11 | 5.8 |
| Worst | 50 | 0 | 0 | 0 | 0.1 | 50 | Worst | 34.6 | 1.8 | 18.3 | 0.4 | 32.3 | 12.6 |
| LVEF | | | | | | | MLHFQ | | | | | | |
| Rank | Control | Aerobic | Combine | HIIT | Strength | IMT | Rank | Control | Aerobic | Combine | HIIT | Strength | IMT |
| Best | 20.2 | 4.3 | 71.2 | 0.2 | 4 | 4 | Best | 33.2 | 0 | 3.5 | 1.8 | 10.4 | 51 |
| 2nd | 0.2 | 63.7 | 13.2 | 19.2 | 0.5 | 3.2 | 2nd | 51 | 2.4 | 14.9 | 6.3 | 10.5 | 14.9 |
| 3rd | 11.1 | 15 | 57.4 | 8 | 2.9 | 5.8 | 3rd | 14.2 | 13.5 | 35 | 15.4 | 12 | 9.9 |
| 4th | 64.9 | 1.1 | 19.5 | 1.4 | 6.7 | 6.4 | 4th | 1.5 | 33.7 | 26 | 20.4 | 11.3 | 7.1 |
| 5th | 22.3 | 0 | 5.1 | 0.2 | 51.9 | 20.4 | 5th | 0.1 | 35.4 | 14.9 | 27.2 | 14.7 | 7.7 |
| Worst | 1.5 | 0 | 0.5 | 0 | 37.8 | 60.2 | Worst | 0 | 14.9 | 5.7 | 28.9 | 41.1 | 9.4 |
| MHR | | | | | | | MAX_Workload | | | | | | |
| Rank | Control | Aerobic | Combine | HIIT | Strength | IMT | Rank | Control | Aerobic | Combine | HIIT | Strength | IMT |
| Best | 0 | 22.5 | 4.8 | 12.6 | 5.6 | 54.5 | Best | 0 | 53.4 | 8.4 | 16.6 | 21.6 | _ |
| 2nd | 0.7 | 44.2 | 10.4 | 29.2 | 8.8 | 6.6 | 2nd | 0.1 | 34.1 | 24.2 | 24.6 | 17.1 | _ |
| 3rd | 6.7 | 26.3 | 18.7 | 30.9 | 9.9 | 7.5 | 3rd | 1.6 | 10.9 | 36 | 29.2 | 22.4 | _ |
| 4th | 26.9 | 6.4 | 26.8 | 18.3 | 15.2 | 6.4 | 4th | 14.7 | 1.6 | 29.9 | 26.7 | 27.2 | _ |
| 5th | 44.1 | 0.6 | 22.7 | 6.8 | 18.8 | 7.1 | Worst | 83.7 | 0 | 1.5 | 3 | 11.8 | _ |
| Worst | 21.5 | 0 | 16.6 | 2.1 | 41.8 | 18 | | | | | | | |


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**Table S9** SCURA score and mean rank for all primary training

| Exercise | Peak $VO_2$ (mL/kg/min) | | HR MAX (beats/min) | | LVEF% | | MLHFQ | | 6MWT(M) | | MAX workload/W | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SUCRA% | Mean Rank | SUCRA% | Mean Rank | SUCRA% | Mean Rank | SUCRA% | Mean Rank | SUCRA% | Mean Rank | SUCRA% | Mean Rank |
| Control | 10.1 | 5.5 | 24.6 | 4.8 | 23.8 | 4.8 | 16.3 | 5.2 | 18.1 | 5.1 | 4.7 | 4.8 |
| Aerobic training | 64.4 | 2.8 | 76.5 | 2.2 | 77.8 | 2.1 | 69.4 | 2.5 | 50.3 | 3.5 | 84.6 | 1.6 |
| Combine training | 41.7 | 3.9 | 39.7 | 4 | 50.3 | 3.5 | 49.7 | 3.5 | 33.3 | 4.3 | 51.7 | 2.9 |
| HIIT | 90.8 | 1.5 | 62.9 | 2.9 | 90.5 | 1.5 | 69.6 | 2.5 | 85.3 | 1.7 | 56.8 | 2.7 |
| Strength training | 74.7 | 2.3 | 28.7 | 4.6 | 49.9 | 3.5 | 67.1 | 2.6 | 41.7 | 3.9 | 52.1 | 2.9 |
| IMT | 18.3 | 5.1 | 67.7 | 2.6 | 7.7 | 5.6 | 27.8 | 4.6 | 71.3 | 2.4 | _ | _ |

**Table S10** SCURA values for exercise subgroups and outcomes

| Type of Exercise | Type of subgroup exercise | $VO_2$ | 6MWT | MHR | LVEF | MLHFQ | Max_workload |
|---|---|---|---|---|---|---|---|
| Aerobic | bicycle | 72.3 | 75 | 59.5 | 91.7 | 89.7 | 92.2 |
| | walking | 47.3 | 42.5 | 48.1 | 75.4 | 50.8 | 38.8 |
| | running | 72.2 | 70.4 | 57.9 | 54.7 | 43.1 | _ |
| | CAT | 61 | 51.6 | 83.2 | 42.6 | 39.3 | 48.2 |
| | OAT | 33.2 | 48.7 | _ | _ | 49.3 | _ |
| Combine | AT+ST | 32.4 | 27.5 | 40 | 47.2 | 26.7 | 42.4 |
| | AT+IMT | 57.5 | 69.6 | 56 | 36.8 | 77.2 | _ |
| | ST+IMT | 44.2 | _ | _ | _ | _ | _ |
| | ST+HIIT | 57.9 | _ | _ | _ | _ | _ |
| HIIT | | 80.3 | 74.9 | 52.5 | 80 | 66.3 | 61.3 |
| ST | | 68 | 56.3 | 28.5 | 12.6 | 73.8 | 56.4 |
| IMT | | 13.9 | 4.3 | 49.3 | 17.9 | 14.6 | _ |


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**Table S11** Peak $VO_2$ intake subgroup exercise mode Bayesian table of rank probabilities and surface under the cumulative ranking curve

| RANK | Control | Bicycle | Walking | Running | CAT | OAT | AT+ST | AT+IMT | ST+IMT | ST+HIIT | HIIT | ST | IMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Best | 0 | 4.5 | 1.1 | 26.1 | 1.4 | 2.8 | 0 | 14.6 | 9.4 | 18.9 | 11.6 | 9.1 | 0.5 |
| 2nd | 0 | 11.9 | 2.7 | 14.5 | 4.3 | 2.6 | 0 | 10.1 | 6.8 | 9.6 | 23.3 | 13.6 | 0.5 |
| 3rd | 0 | 18.1 | 3.9 | 9.9 | 7.6 | 2.8 | 0.1 | 7.4 | 4.7 | 6.8 | 25 | 12.9 | 0.9 |
| 4th | 0 | 21.1 | 6.6 | 8.1 | 12.9 | 3.2 | 0.5 | 6.4 | 4.2 | 5.5 | 17.6 | 13 | 0.9 |
| 5th | 0 | 18.4 | 8.5 | 6.8 | 18 | 3.8 | 1 | 6.6 | 5 | 6.7 | 11 | 12.8 | 1.4 |
| 6th | 0 | 12.9 | 12.1 | 7.8 | 20 | 4.4 | 3.7 | 7.3 | 4.8 | 6.1 | 7.1 | 12 | 1.9 |
| 7th | 0 | 8.4 | 14.9 | 7.1 | 17.9 | 6.7 | 8.1 | 7.9 | 6.8 | 6.6 | 2.9 | 10.4 | 2.2 |
| 8th | 0.1 | 3.8 | 17.2 | 6.5 | 10.9 | 9.3 | 17.2 | 8.5 | 7.3 | 6.7 | 1 | 7.7 | 3.7 |
| 9th | 0.5 | 0.8 | 14.8 | 5.2 | 5.3 | 10.1 | 24.7 | 9.8 | 9.5 | 8.2 | 0.4 | 5.2 | 5.5 |
| 10th | 6.4 | 0.1 | 11.1 | 4.2 | 1.3 | 12.8 | 27.1 | 8.5 | 10.3 | 8.1 | 0.1 | 2.3 | 7.7 |
| 11th | 25.9 | 0 | 5.3 | 2.3 | 0.2 | 14.4 | 14.1 | 6.3 | 10.6 | 6.6 | 0 | 1 | 13.4 |
| 12th | 43.4 | 0 | 1.5 | 1 | 0.1 | 13.4 | 3.4 | 3.8 | 9.9 | 5.3 | 0 | 0 | 18.3 |
| Worst | 23.8 | 0 | 0.3 | 0.5 | 0 | 13.7 | 0.2 | 2.8 | 10.8 | 4.9 | 0 | 0 | 43 |


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**Table S12** Subgroup analysis of LVEF and age in NMA

| 6MWT (*vs.* Control) | | | |
|---|---|---|---|
| Type of Exercise | Characteristic | | Effect (SMD) |
| Aerobic | Age | <65Y | 0.41 (0.08, 0.75) |
| | | >65Y | 0.13 (-0.93, 1.20) |
| | LVEF | <30% | 0.19(-0.34, 0.72) |
| | | 30-40% | 0.61 (0.23, 0.98) |
| | | >40% | 0.33 (-2.33, 3.00) |
| Combine | Age | <65Y | 0.42 (-0.00, 0.85) |
| | | >65Y | -0.64 (-2.16, 0.89) |
| | LVEF | <30% | 0.50 (-0.33, 1.34) |
| | | 30-40% | 0.70 (0.17, 1.23) |
| | | >40% | -1.30 (-3.63, 1.01) |
| HIIT | LVEF | <30% | 1.28 (0.33, 2.23) |
| | | 30-40% | 0.73 (-0.12, 1.59) |
| | | >40% | _ |
| HR (*vs.* Control) | | | |
| Type of Exercise | Characteristic | | Effect (SMD) |
| Aerobic training | Age | <65Y | 0.28 (0.02, 0.54) |
| | | >65Y | 0.82 (0.07, 1.58) |
| | LVEF | <30% | -0.04 (-0.31, 0.23) |
| | | 30-40% | 0.49 (0.03, 0.95) |
| | | >40% | 0.60 (0.10, 1.10) |
| Combine training | Age | <65Y | 0.11 (-0.38, 0.59) |
| | | >65Y | -0.11 (-1.40, 1.18) |
| | LVEF | <30% | -0.23 (-0.73, 0.26) |
| | | 30-40% | 0.19 (-0.65, 1.04) |
| | | >40% | -0.11 (-0.98, 0.76) |
| HIIT | Age | <65Y | 0.20 (-0.19, 0.59) |
| | | >65Y | 0.78 (-0.34, 1.90) |
| | LVEF | <30% | -0.02 (-0.55, 0.51) |
| | | 30-40% | 0.31 (-0.38, 1.00) |
| | | >40% | 0.51 (-0.13, 1.16) |

**Table S12** (*continued*)


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**Table S12** (*continued*)

| MLHFQ (*vs.* Control) | | | |
|---|---|---|---|
| Type of Exercise | Characteristic | | Effect (SMD) |
| Aerobic training | Age | <65Y | -1.29 (-2.07, -0.50) |
| | | >65Y | -0.29 (-0.59, 0.02) |
| | LVEF | <30% | -0.19 (-0.68, 0.30) |
| | | 30-40% | -1.19 (-2.07, -0.31) |
| | | >40% | -0.43 (-0.92, 0.06) |
| Combine training | Age | <65Y | -0.81 (-1.70, 0.09) |
| | | >65Y | -0.15 (-0.68, 0.39) |
| | LVEF | <30% | -0.51 (-1.08, 0.06) |
| | | 30-40% | -0.47 (-1.75, 0.82) |
| | | >40% | -0.18 (-0.84, 0.48) |
| HIIT | Age | <65Y | -1.54 (-2.75, -0.33) |
| | | >65Y | 0.54 (-0.22, 1.29) |
| | LVEF | <30% | -0.84 (-1.83, 0.15) |
| | | 30-40% | -0.82 (-2.22, 0.58) |
| | | >40% | -0.89 (-2.32, 0.54) |
| MAX_Workload (*vs.* Control) | | | |
| Type of Exercise | Characteristic | | Effect (SMD) |
| Aerobic training | Age | <65Y | 1.74 (0.99, 2.49) |
| | | >65Y | 2.06 (-0.15, 4.27) |
| | LVEF | <30% | 2.18 (0.36, 4.00) |
| | | 30-40% | 2.35 (1.08, 3.62) |
| | | >40% | 0.82 (0.41, 1.24) |
| Combine training | Age | <65Y | 1.48 (0.29, 2.66) |
| | | >65Y | 0.14 (-2.89, 3.18) |
| | LVEF | <30% | 1.49 (-1.36, 4.33) |
| | | 30-40% | 2.20 (0.00, 4.41) |
| | | >40% | 0.15 (-0.37, 0.67) |
| HIIT | LVEF | <30% | _ |
| | | 30-40% | 1.74 (-0.20, 3.68) |
| | | >40% | -0.46 (-1.40, 0.46) |


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**Table S13** Inconsistency analysis for NMA in primary training

| Analysis | P value for global inconsistency | P value for local inconsistency (A: Control; B: Aerobic training; C: Combine training; D: HIIT; E: Strength training) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AB | AC | AD | AE | BC | BD | BE | CD | CE | DE |
| $VO_2$ | 0.5991 | 0.465 | 0.943 | 0.181 | 0.357 | 0.41 | 0.054 | 0.417 | 0.551 | 0.791 | 0.949 |
| LVEF | 0.9688 | 0.352 | 0.371 | 0.47 | 0.969 | 0.319 | 0.24 | 0.928 | | 0.739 | |
| HR | 0.0715 | 0.202 | 0.341 | 0.965 | 0.234 | 0.341 | 0.841 | 0.538 | - | - | 0.635 |
| 6MWT | 0.6576 | 0.499 | 0.665 | 0.319 | 0.223 | 0.492 | 0.318 | 0.223 | - | - | - |
| MLHFQ | 0.6393 | 0.699 | 0.211 | 0.926 | 0.67 | 0.506 | 0.629 | 0.652 | - | 0.655 | - |
| MAX-Workload | 0.8979 | 0.054 | 0.124 | 0.272 | 0.861 | 0.123 | 0.474 | 0.287 | 0.846 | 0.513 | 0.479 |
| | | P value for loop inconsistency | | | | | | | | | |
| | | B-C-D | A-B-D | B-C-E | C-D-E | A-B-E | A-C-D | A-C-E | A-B-C | A-D-E | B-D-E |
| $VO_2$ | | 0.216 | 0.107 | 0.5 | 0.2 | 0.52 | 0.848 | 0.945 | 0.883 | 0.95 | 0.994 |
| LVEF | | - | 0.472 | 0.759 | - | 0.997 | - | 0.526 | 0.414 | - | - |
| HR | | - | 0.348 | - | - | 0.499 | - | - | - | 0.183 | 0.238 |
| 6MWT | | - | 0.107 | - | - | 0.099 | - | - | 0.68 | - | - |
| MLHFQ | | - | 0.941 | 0.758 | - | 0.746 | - | 0.812 | 0.435 | - | - |
| MAX-Workload | | 0.464 | 0.428 | 0.15 | 0.681 | 0.663 | 0.642 | 0.038 | 0.182 | 0.248 | 0.064 |


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**Table S14** Inconsistency analysis in subgroups exercise mode for NMA

| Variables | P value |
|---|---|
| $VO_2$ | |
| P for all | 0.176 |
| Loop | |
| Control *vs.* Running | 0.022 |
| Bicycle *vs.* ST | 0.009 |
| Walking *vs.* AT+ST | 0.003 |
| Circle | |
| Control-Walking-AT+ST | 0.007 |
| 6MWT | |
| P for all | 0.873 |
| Loop | NA |
| Circle | NA |
| LVEF | |
| P for all | 0.456 |
| Loop | |
| Control *vs.* ST | 0.046 |
| Circle | |
| Control-Walking-HIIT | 0.033 |
| Max_Workload | |
| P for all | 0.934 |
| Loop | NA |
| Circle | NA |
| MLHFQ | |
| P for all | 0.292 |
| Loop | NA |
| Circle | NA |
| MHR | |
| P for all | 0.376 |
| Loop | |
| Bicycle *vs.* ST | 0.047 |
| Circle | |
| Bicycle-CAT-AT+IMT-ST | 0.019 |


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