Supplemental Online Content

Balachandran AT, Steele J, Angielczyk D, et al. Comparison of power training vs traditional strength training on physical function in older adults: a systematic review and meta-analysis. *JAMA Netw Open*. 2022;5(5):e2211623. doi:10.1001/jamanetworkopen.2022.11623

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This supplemental material has been provided by the authors to give readers additional information about their work.
**eTable 1. Reasons for exclusions**

|   | Reference | Intervention | Reason |
|---|-----------|--------------|--------|
| 1. | Mizszo_2003<sup>1</sup> | Intervention | Used jump squats |
| 2. | Balachandran_2014<sup>2</sup> | Intervention | Used circuit training in addition to power training in the power group using pneumatics. Control group used weight machines and had no circuit training. |
| 3. | Bean_2009<sup>3</sup> | Intervention | Exercises different between groups. Exercises were based on normal functional task. Control grp performed seated exercises |
| 4. | Bean_2004<sup>4</sup> | Intervention | Exercises different between groups. Exercises were based on normal functional task. Control grp performed seated exercises |
| 5. | Ramirez-Campillo 2014<sup>5</sup> | Intervention | Power training involved counter movement jumps |
| 6. | Yoon_2017<sup>6</sup> | Population | Population with mild cognitive impairment |
| 7. | Englund_2017<sup>7</sup> | Intervention | Isokinetic exercises with same instructions for both groups |
| 8. | Macaluso_2003<sup>8</sup> | Intervention | Same speed for both groups. During each set, all participants were required to pedal as fast as possible |
| 9. | Richardson_2018<sup>9</sup> | Design | Cross over trial |
| 10. | Hart_2003<sup>10</sup> | Journal club abstract | |
| 11. | Vilada_2007<sup>11</sup> | Design | Not randomized. |
| 12. | Drey_2012<sup>12</sup> | Duplicate | Used Zech_2012 instead since same data |
| 13. | Vieira_2021<sup>13</sup> | Design | Not randomized |

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2. Balachandran A, Krawczyk SN, Potiaumpai M, Signorile JF. High-speed circuit training vs hypertrophy training to improve physical function in sarcopenic obese adults: A randomized controlled trial. *Exp Gerontol*. 2014;60:64-71.

3. Bean JF, Kiely DK, LaRose S, O’Neill E, Goldstein R, Frontera WR. Increased velocity exercise specific to task training versus the national institute on aging’s strength training program: Changes in limb power and mobility. *J Gerontol A Biol Sci Med Sci*. 2009;64(9):983-991.

4. Bean JF, Herman S, Kiely DK, et al. Increased velocity exercise specific to task (InVEST) training: A pilot study exploring effects on leg power, balance, and mobility in community-dwelling older women. *J Am Geriatr Soc*. 2004;52(5):799-804.

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6. Yoon DH, Kang D, Kim H, Kim J, Song HS, Song W. Effect of elastic band-based high-speed power training on cognitive function, physical performance and muscle strength in older women with mild cognitive impairment. *Geriatrics & gerontology international*. 2017;17(5):765-772.
7. Englund DA, Sharp RL, Selsby JT, Ganesan SS, Franke WD. Resistance training performed at distinct angular velocities elicits velocity-specific alterations in muscle strength and mobility status in older adults. *Exp Gerontol*. 2017;91:51-56.

8. Macaluso A, Young A, Gibb KS, Rowe DA, De Vito G. Cycling as a novel approach to resistance training increases muscle strength, power, and selected functional abilities in healthy older women. *J Appl Physiol (1985)*. 2003;95(6):2544-2553.

9. Richardson DL, Duncan MJ, Jimenez A, Jones VM, Juris PM, Clarke ND. Movement velocity during high- and low-velocity resistance exercise protocols in older adults. *Exp Gerontol*. 2018;107:140-147.

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11. Villada J, Da Silva M, Alonso J. Influence of a training programme with jumps on explosive force, speed of movement and dynamic balance in the elderly. *REVISTA ESPANOLA DE GERIATRIA Y GERONTOLOGIA*. 2007;42(4):218.

12. Drey M, Zech A, Freiberger E, et al. Effects of strength training versus power training on physical performance in prefail community-dwelling older adults. *Gerontology*. 2012;58(3):197-204.

13. Vieira IP, Lobo PC, Fisher J, Ramirez-Campilo R, Pimentel GD, Gentil P. Effects of high-speed versus traditional resistance training in older adults. *Sports Health*. 2021:19417381211015211.
eFigure 1. Flow Diagram of Trial Identification and Selection for the updated search (October 2019 – October 2021)

**Identification of studies via databases**

Records identified from*: Databases (n=3,764)
- Medline=785
- Embase=1457
- CENTRAL=701
- Cinahl=517
- PsycInfo=6
- Pedro=24
- SPORTDiscus=274

Duplicate records removed before screening. (n=2203)

Records screened *(title & abstract)* (n=1561)

Reports assessed for eligibility *(full text screening)* (n=7)

Reports excluded*: Design (n=1)
- Abstract (n=1)
- Not in English (n=1)
- Included in the first search (n=2)

Studies included in meta-analysis (n=2)
| Study            | Physical function | Power | Strength | Gait Speed | Muscle   | Balance     |
|------------------|-------------------|-------|----------|------------|----------|-------------|
| Feilding_2003    | None              | LP, KE| LP,KE    | -          | -        | -           |
| Bottaro_2007     | GUG,CS            | LP, CP| LP,CP    | -          | --       | -           |
| Henwood_2008     | CS,SC             | CP,LP,BC,LE,LC | BP,R,BC,LP,L  | 400m, 6m | LBM (DXA)- | FR          |
| Kendall_2008     | None              | KE,LP | KE,LP    | -          | -        | -           |
| Bottaro_2007     | SC                | KE,LP | KE,LP    | -          | LBM (DXA) | -           |
| Henwood_2008     | CS                | CP,LP,BC,LE,LC | BP,R,BC,LP,L  | 400m, 6m | LBM (DXA)- | FR          |
| Kendall_2008     | None              | KE,LP | KE,LP    | -          | LBM (DXA) | -           |
| Bottaro_2007     | SC                | KE,LP | KE,LP    | -          | LBM (DXA) | -           |
| Henwood_2008     | CS                | CP,LP,BC,LE,LC | BP,R,BC,LP,L  | 400m, 6m | LBM (DXA)- | FR          |
| Kendall_2008     | None              | KE,LP | KE,LP    | -          | LBM (DXA) | -           |
| Bottaro_2007     | SC                | KE,LP | KE,LP    | -          | LBM (DXA) | -           |
| Henwood_2008     | CS                | CP,LP,BC,LE,LC | BP,R,BC,LP,L  | 400m, 6m | LBM (DXA)- | FR          |
| Kendall_2008     | None              | KE,LP | KE,LP    | -          | LBM (DXA) | -           |
| Bottaro_2007     | SC                | KE,LP | KE,LP    | -          | LBM (DXA) | -           |
| Henwood_2008     | CS                | CP,LP,BC,LE,LC | BP,R,BC,LP,L  | 400m, 6m | LBM (DXA)- | FR          |
| Kendall_2008     | None              | KE,LP | KE,LP    | -          | LBM (DXA) | -           |
| Bottaro_2007     | SC                | KE,LP | KE,LP    | -          | LBM (DXA) | -           |
| Müller_2020 | GUG, SC, CS | KE, CMJ, CE | LP, KE | LBM (DXA), RFT, VLT, VMT | - |
|-----------|-------------|------------|-------|--------------------------|---|
| Total studies | 13,3 | 15 | 15 | 6 | 10 | 5 |

**NOTE:** There could be more than one measure for the above measures in one study. For ex, LP power at 70% and 40% 1RM, 6m usual and fast-paced walk.

**Strength & Power - LP:** Leg press, LE: Leg extension, LC: Leg curls, KE: Kee Extension, KF: Knee flexion, KC: Knee curls, HF: Hip flexion, HE: Hip extension, DF: Dorsi flexion, AE: Ankle extension, STS: Sit to Stand, CMJ: Counter movement jump, SJ: Standing jump, CE: Cycle ergometer.
CP: Chest press, BC: Bicep’s curl, BP: Bench press, GS: Grip strength, R: Rows, AC: Arm curls, BO: Bent over Row, LR: Lateral raise, TE: Triceps extension.

**Muscle mass - LBM:** Lean body mass, FFM: Fat free mass, ALM: Appendicular lean mass, VLT: Vastus Lateralis thickness, VLM: Vastus medialis thickness, RFT: Rectus femoris thickness, BBT: Biceps brachii thickness, QCSA: Quadriceps cross sectional area, DXA: Dual-energy x-ray absorptiometry, US: Ultrasound, BIA: Bioelectrical Impedance Analyzer, MRI: Magnetic Resonance Imaging.

**Balance – FR:** Functional reach, SB: Standing balance, FL: Forward lean, LL: Lateral lean, OLS: One legged stance, SI: Step Initiation, PP: Preparation phase, SP: Swing phase, TT: Total time.
**eTable 3. Sub-group and meta-regression analyses**

| Subgroups                              | Estimate (95% CI)                      |
|----------------------------------------|----------------------------------------|
| High vs. Low Risk of Bias (ROB)        | 0.48 (-0.16, 1.12) High ROB            |
|                                        | 0.18 (-0.06, 0.42) Low ROB             |
|                                        | -0.30 (-0.80, 0.19), P = 0.23 (contrasts) |
| High vs Low function                   | 0.34 (-0.004, 0.69) High function      |
|                                        | 0.19 (0.067, 0.31) Low function        |
|                                        | -0.15 (-0.46, 0.15), P = 0.32 (contrasts) |
| **Outcomes**                           | **Coefficients (95% CI)**              |
| Age                                    | 0.02 (-0.01, 0.05 ), P = 0.26          |
| BMI                                    | -0.06 (-0.20, 0.07), P = 0.31          |
| Sex                                    | 0.002 (-0.008, 0.013 ), P = 0.65       |
| Duration                               | 0.001 (-0.01, 0.01), P = 0.88          |
| Frequency                              | 0.36 (-0.009, 0.73), P = 0.05          |
| Relative Load                          | 0.005 (-0.01, 0.02), P = 0.49          |

**NOTE:** a. Full output available at [https://osf.io/syjnx/](https://osf.io/syjnx/)

b. Meta-regression scatter plots available in OSF under “Secondary Analyses” folder: [https://osf.io/uzqxi/](https://osf.io/uzqxi/).
# eTable 4. ROB for primary outcomes

1. ROB for physical function outcome

| Study      | D1 | D2 | D3 | D4 | D5 | Overall |
|------------|----|----|----|----|----|---------|
| Rottaro    | -  | +  | +  | +  | +  | -       |
| Correa     | -  | +  | +  | +  | +  | -       |
| Marsh      | +  | +  | +  | +  | +  | +       |
| Zeich      | +  | +  | -  | +  | +  | +       |
| Henwood    | -  | +  | +  | -  | -  | -       |
| Gray       | X  | +  | +  | -  | -  | X       |
| Lopes      | -  | +  | X  | +  | +  | X       |
| Richardson | -  | +  | +  | X  | +  | X       |
| Tiggemann  | -  | +  | -  | +  | +  | -       |
| Jaque      | -  | X  | +  | +  | +  | X       |
| Coelho-Jr  | -  | +  | +  | -  | +  | -       |
| Muller     | +  | +  | +  | +  | +  | +       |
| Moreno     | -  | X  | -  | +  | +  | X       |

Domains:
D1: Bias arising from the randomization process.
D2: Bias due to deviations from intended intervention.
D3: Bias due to missing outcome data.
D4: Bias in measurement of the outcome.
D5: Bias in selection of the reported result.

Judgement:
- High
- Some concerns
- Low

## Bias arising from the randomization process

- Low risk
- Some concerns
- High risk

## Bias due to deviations from intended interventions

- Low risk
- Some concerns
- High risk

## Bias due to missing outcome data

- Low risk
- Some concerns
- High risk

## Bias in measurement of the outcome

- Low risk
- Some concerns
- High risk

## Bias in selection of the reported result

- Low risk
- Some concerns
- High risk

## Overall risk of bias

- Low risk
- Some concerns
- High risk

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2. ROB for **self-reported** physical function outcome

| Study     | D1 | D2 | D3 | D4 | D5 | Overall |
|-----------|----|----|----|----|----|---------|
| Katula    | +  | +  | +  | +  | +  | +       |
| Marsh     | +  | +  | +  | +  | +  | +       |
| Zech      | +  | +  | -  | +  | +  | -       |

**Risk of bias domains**
- D1: Bias arising from the randomization process.
- D2: Bias due to deviations from intended intervention.
- D3: Bias due to missing outcome data.
- D4: Bias in measurement of the outcome.
- D5: Bias in selection of the reported result.

**Judgement**
- `+` Low
- `-` Some concerns

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**Overall risk of bias**

- Bias arising from the randomization process: Low risk
- Bias due to deviations from intended interventions: Low risk
- Bias due to missing outcome data: Some concerns
- Bias in measurement of the outcome: Low risk
- Bias in selection of the reported result: Some concerns

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## Secondary Outcomes

### Power

| Domain     | Study 1 | Study 2 | Study 3 | Study 4 | Overall |
|------------|---------|---------|---------|---------|---------|
| Strength   | ![Image] | ![Image] | ![Image] | ![Image] | ![Image] |
| Muscle     | ![Image] | ![Image] | ![Image] | ![Image] | ![Image] |

### Strength

| Domain     | Study 1 | Study 2 | Study 3 | Study 4 | Overall |
|------------|---------|---------|---------|---------|---------|
| Power      | ![Image] | ![Image] | ![Image] | ![Image] | ![Image] |
| Muscle     | ![Image] | ![Image] | ![Image] | ![Image] | ![Image] |

### Muscle

| Domain     | Study 1 | Study 2 | Study 3 | Study 4 | Overall |
|------------|---------|---------|---------|---------|---------|
| Power      | ![Image] | ![Image] | ![Image] | ![Image] | ![Image] |
| Gait       | ![Image] | ![Image] | ![Image] | ![Image] | ![Image] |

### Gait

| Domain     | Study 1 | Study 2 | Study 3 | Study 4 | Overall |
|------------|---------|---------|---------|---------|---------|
| Balance    | ![Image] | ![Image] | ![Image] | ![Image] | ![Image] |
| Strength   | ![Image] | ![Image] | ![Image] | ![Image] | ![Image] |

### Balance

| Domain     | Study 1 | Study 2 | Study 3 | Study 4 | Overall |
|------------|---------|---------|---------|---------|---------|
| Power      | ![Image] | ![Image] | ![Image] | ![Image] | ![Image] |
| Muscle     | ![Image] | ![Image] | ![Image] | ![Image] | ![Image] |

### Summary

- **Domains:**
  - Power
  - Strength
  - Muscle
  - Gait
  - Balance

- **Risk Levels:**
  - High
  - Some concerns
  - Low

- **Risk of Bias:**
  - Selection bias
  - Performance bias
  - Detection bias
  - Attrition bias
  - Reporting bias
  - Other bias

- **Judgment:**
  - High
  - Some concerns
  - Low

- **Notes:**
  - Study designs
  - Study quality
  - Study outcomes
  - Study conclusions

### References

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**eTable 5. GRADE summary of findings**

| Outcomes                        | Participants (studies) | Risk of bias | Inconsistency | Indirectness | Imprecision | Publication bias | Overall certainty | Absolute effects 95%CI |
|---------------------------------|------------------------|--------------|---------------|--------------|-------------|------------------|------------------|---------------------|
| Physical Function               | 403 (13 RCTs)          | serious<sup>a</sup> | not serious   | not serious  | serious<sup>b</sup> | undetected        | Low              | **SMD 0.30 SD higher** (0.05 higher to 0.54 higher) |
| Self-reported function          | 85 (3 RCTs)            | not serious  | not serious   | not serious  | very serious<sup>bc</sup> | undetected        | Low              | **SMD 0.38 SD higher** (0.62 lower to 1.37 higher) |

**Secondary outcomes**

| Power                           | 409 (15 RCTs)          | serious<sup>a</sup> | not serious   | not serious  | serious<sup>b</sup> | undetected        | Low              | **SMD 0.44 SD higher** (0.21 higher to 0.66 higher) |
|---------------------------------|------------------------|----------------------|---------------|--------------|-------------------|------------------|------------------|---------------------|
| Strength                        | 433 (15 RCTs)          | serious<sup>a</sup> | not serious   | not serious  | serious<sup>b</sup> | undetected        | Low              | **SMD 0.01 SD lower** (0.14 lower to 0.16 higher) |
| Muscle                          | 336 (10 RCTs)          | serious<sup>a</sup> | not serious   | not serious  | serious<sup>b</sup> | undetected        | Low              | **SMD 0.0004 SD lower** (0.08 lower to 0.08 higher) |
| Gait speed                      | 189 (6 RCTs)           | serious<sup>a</sup> | not serious   | not serious  | serious<sup>b</sup> | undetected        | Low              | **SMD 0.03 SD lower** (0.16 lower to 0.10 higher) |
| Balance                         | 139 (4 RCTs)           | serious<sup>a</sup> | serious<sup>d</sup> | not serious  | very serious<sup>bc</sup> | undetected        | Very low         | **SMD 0.05 SD higher** (0.82 lower to 0.92 higher) |

CI: confidence interval; SMD: standardized mean difference

Explanations
- a. Downgraded by one level for serious risk of bias
- b. Downgraded by one level because Optimum Information Size (OIS) less than 800 participants
- c. Downgraded by 2 levels due to CI including appreciable harm and appreciable benefit
- d. Downgraded for high inconsistency ($I^2 = 74\%$)

**NOTE:** For imprecision, we used the null effect threshold for primary outcomes and a small effect threshold (0.20) for secondary outcomes. We used the optimum information size (OIS) of <800 participants for rating down as recommended. For risk of bias, we downgraded when most studies had high ROB or some concerns. For the rest and overall certainty, we followed the GRADE recommendations.
**eTable 6. Sensitivity analysis**

### Single function tests$^a$

| Outcomes                | Estimate (95% CI)                      |
|-------------------------|----------------------------------------|
| Get up & go             | 0.34 (0.04, 0.63), $\text{I}^2 = 54\%$ |
| Chair stands            | 0.13 (-0.06, 0.32), $\text{I}^2 = 0\%$ |
| Stair climb             | 0.32 (0.11, 0.52), $\text{I}^2 = 28\%$ |

$a$. Full output available at [https://osf.io/sutzf/](https://osf.io/sutzf/)

### Dropping Influential study for primary outcomes$^{bc}$

| Outcomes                  | Estimate (95% CI)                      |
|---------------------------|----------------------------------------|
| Physical function         | 0.23 (0.03, 0.43), $\text{I}^2 = 31\%$ |
| Self-reported physical function | 0.64 (0.27, 1.0), $\text{I}^2 = 32\%$ |

$b$. Full output available at [https://osf.io/sutzf/](https://osf.io/sutzf/)

$c$. Hat values & Cook’s distances at [https://osf.io/ndqwb/](https://osf.io/ndqwb/)

### Pre-post correlation using $r = 0.5^c$

| Outcomes                  | Estimate (95% CI)                      |
|---------------------------|----------------------------------------|
| Physical function         | 0.28 (0.06, 0.49), $\text{I}^2 = 22\%$ |
| Self-reported physical function | 0.36 (-0.64, 1.36), $\text{I}^2 = 9\%$ |

$c$. Full output available at [https://osf.io/jqhn2/](https://osf.io/jqhn2/)

### Pre-post correlation using $r = 0.9^d$

| Outcomes                  | Estimate (95% CI)                      |
|---------------------------|----------------------------------------|
| Physical function         | 0.31 (0.05, 0.56), $\text{I}^2 = 76\%$ |
| Self-reported physical function | 0.40 (-0.60, 1.39), $\text{I}^2 = 64\%$ |

$d$. Full output available at [https://osf.io/brkax/](https://osf.io/brkax/)
eFigure 2. Funnel plot

Funnel plot of all effects

Between Condition Treatment Effect Comparison (Hedge's g; Postive values favour POW)
eAppendix 1. Search strategy

Medline
middle aged/ or exp aged/ or exp geriatrics/ or healthy aging/ or exp aging/
independent living/ or "housing for the elderly"/
(middle age* or middle age* or old age or midlife or aged or aging or ageing or elderly or elders or senior or seniors or geriatric* or older or late life or late)
((community or independent or solo or alone) adj3 (dwelling or living)).ti,ab,kf
or/1-4
resistance training/
((power or high-velocity or velocity or ballistic or explosive*) adj5 (train* or lift* or resistance or concentric or exerc*)).ti,ab,kf
(high-speed resistance).ti,ab,kf
((fast or quick or speed* or velocity) adj2 (reps or repetition*)).ti,ab,kf
(complex training or contrast training or speed-strength).ti,ab,kf
or/6-10
(controlled clinical trial or randomized controlled trial).pt.
clinical trials as topic.sh.
(randomized or randomly or RCT$1 or placebo*).tw.
((singl* or doubl* or trebl* or tripl*) adj (mask* or blind* or dumm*)).tw.
trial.ti.
or/12-16
5 and 11 and 17
exp Animals/ not (exp Animals/ and Humans/)
(exp child/ or exp infant/ or exp adolescent/) not ((exp child/ or exp infant/ or exp adolescent/) and (exp aged/ or exp adult/))
(comment or editorial or interview or news).pt.
(letter not (letter and randomized controlled trial)).pt.
18 not (19 or 20 or 21 or 22)
Embase

middle aged/ or exp aged/ or exp geriatrics/ or exp aging/

independent living/ or "home for the aged"/

(middleage* or middle age* or old age or midlife or aged or aging or ageing or elderly or elders or senior or seniors or geriatric* or older or late life or lat

(or/1-4

resistance training/

((power or high-velocity or velocity or ballistic or explosive*) adj5 (train* or lift* or resistance or concentric or exerci*)).ti,ab,kw

(high-speed resistance).ti,ab,kw

((fast or quick or speed* or velocity) adj2 (reps or repetition*)).ti,ab,kw

(complex training or contrast training or speed-strength).ti,ab,kw

or/6-10

exp controlled clinical trial/

exp "clinical trial (topic)"/

(randomized or randomly or RCT$1 or placebo*).tw.

((singl* or doubl* or trebl* or tripl*) adj (mask* or blind* or dumm*)).tw.

trial.ti.

or/12-16

S and 11 and 17

(exp Animal/ or nonhuman/) not ((exp Animal/ or nonhuman/) and exp Human/)

(exp child/ or exp adolescent/) not ((exp child/ or exp adolescent/) and (exp adult/))

(editorial or note).pt.

letter.pt not (letter.pt and randomized controlled trial/)

18 not (19 or 20 or 21 or 22)
Central

[mh ^"middle aged"] or [mh aged] or [mh geriatrics] or [mh ^"healthy aging"] or [mh aging] 1118
[mh ^"independent living"] or [mh ^"housing for the elderly"] 377
(middleage* or (middle NEAR/1 age*)) or "old age" or midlife or aged or aging or ageing or elderly or elders or senior or seniors or geriatric* or older or ":ti,ab,kw
((community or independent or solo or alone) NEAR/3 (dwelling or living)):ti,ab,kw 5171
{OR #1-#4} 521108
[mh ^"resistance training"] 2952
((power or high-velocity or velocity or ballistic or explosive*) NEAR/5 (train* or lift* or resistance or concentric or exerci*)):ti,ab,kw 2322
("high-speed resistance"):ti,ab,kw 16
((fast or quick or speed* or velocity) NEAR/2 (reps or repetitions)):ti,ab,kw 17
("complex training" or "contrast training" or "speed-strength"):ti,ab,kw 77
{OR #6-#10} 5041
#5 and #11 2372
((mh child) or [mh infant] or [mh adolescent]) not (((mh child) or [mh infant] or [mh adolescent]) and ((mh aged) or [mh adult])) 112976
#12 not #13 2192
Cinahl
(MH "middle age") or (MH aged+) or (MH geriatrics) or (MH "healthy aging") or (MH aging+)
(MH "community living") or (MH "housing for the elderly")
(middleage* or (middle N1 age*) or "old age" or midlife or aged or aging or ageing or elderly or elders or senior or seniors or geriatric* or older or "late life" or "later life")
((community or independent or solo or alone) N3 (dwelling or living))
S1 OR S2 OR S3 OR S4
(MH "resistance training")
((power or high-velocity or velocity or ballistic or explosive*) N5 (train* or lift* or resistance or concentric or exerci*))
("high-speed resistance")
((fast or quick or speed* or velocity) N2 (reps or repetition*))
("complex training" or "contrast training" or "speed-strength")
S6 OR S7 OR S8 OR S9 OR S10
(PT "Clinical trial") or (PT "randomized controlled trial")
(MH "Clinical Trials")
(randomised or randomized or randomly or RCT or RCTs or placebo*)
((singl* or doubl* or trebl* or tripl*) N1 (mask* or blind* or dumm*))
(TI trial)
S12 OR S13 OR S14 OR S15 OR S16
S5 and S11 and S17
(MH vertebrates+) not ((MH vertebrates+) and (MH human))
((MH child+) or (MH adolescence+)) not (((MH child+) or (MH adolescence+)) and (MH adult+))
PT book review or commentary or editorial or interview
(PT letter) not ((PT letter) and (PT "randomized controlled trial"))
S18 not (S19 or S20 or S21 or S22)
1152983
20096
1320074
47778
1337723
22586
9
112
141
26159
171806
266670
298288
67531
94733
425345
2969
167721
525911
396408
273476
2731

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Psycinfo
exp geriatrics/ or exp aging/ or ("360" or "380" or "390").ag
(middle age* or middle age or old age or midlife or aged or aging or ageing or elderly or elders or senior or seniors or geriatric* or older or late life or later life).ti,ab,ids
(or/1-3
((community or independent or solo or alone) adj3 (dwelling or living)).ti,ab,ids
exp clinical trials/
(randomized or randomly or RCT$1 or placebo*).tw.
((singl* or doubl* or trebl* or tripl*) adj (mask* or blind* or dumm*)).tw.
trial.ti.
(or/10-13
4 and 9 and 14
("20").po not ("20" and "10").po
("100" or "200").ag not ("100" or "200") and "300").ag
("2600" or "2800" or "3000" or "3500" or "4600" or "4800" or "5000").dt
15 not (16 or 17 or 18)
Sportdiscuss
DE "OLDER people" OR DE "EXERCISE for older people" OR DE "PHYSICAL education for older people" OR DE "PHYSICAL fitness for older people" OR DE "SPORTS for older people" (middleage* or (middle N1 age*) or "old age" or midlife or aged or aging or ageing or elderly or elders or senior or seniors or geriatric* or old) (community or independent or solo or alone) N3 (dwelling or living)
S1 or S2 or S3
DE "RESISTANCE training" OR DE "CONTRAST training (Physical training & conditioning)"
(power or high-velocity or velocity or ballistic or explosive*) N5 (train* or lift* or resistance or concentric or exerci*)
"high-speed resistance"
(fast or quick or speed* or velocity) N2 (reps or repetition*)
"complex training" or "contrast training" or "speed-strength"
S5 OR S6 OR S7 OR S8 OR S9
(randomized or randomised or randomly or RCT or RCT or placebo* or trial)
(singl* or doubl* or trebl* or tripl*) N1 (mask* or blind* or dumm*)
S11 or S12
S4 and S10 and S13

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| Training Method                      | Number of Trials |
|-------------------------------------|------------------|
| Power training AND clinical trial   | 49               |
| Velocity training AND clinical trial| 6                |
| Ballistic training AND clinical trial| 1               |
| Explosive training AND clinical trial| 2              |
| High-speed resistance AND clinical trial| 8            |
| Complex training AND clinical trial | 3                |
| Contrast training AND clinical trial| 1                |
| Speed-strength AND clinical trial   | 8                |
| Total unique                        | 71               |
### eAppendix 2. Risk of Bias for physical function outcome

| Unique ID | Study ID | Correa | Assessor |
|-----------|----------|--------|----------|
| Ref or Label | Buttars | Aim | assignment to intervention (the 'intention-to-treat' affect) |
| Experimental | Power | Comparator | Control | Source |
| Outcome | Physical Function | Results | Weight |

#### Domain | Signalling question | Response | Comments |
|-----------|--------------------|----------|----------|
| **Bias arising from the randomization process** | 1.1 Was the allocation sequence random? | NI | No info about method of randomization or concealment. Just says "randomly assigned". |
| | 1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions? | NI | |
| | 1.3 Did baseline differences between intervention groups suggest a problem with the randomization process? | N | NO imbalances are apparent or if any observed imbalances are compatible with chance. |
| **Risk of bias judgement** | | Some concerns | |

#### Bias due to deviations from intended interventions

| Domain | Signalling question | Response | Comments |
|--------|--------------------|----------|----------|
| 2.1 Were participants aware of their assigned intervention during the trial? | Y | Yes, both participants and interventionists were aware of the groups |
| 2.2 Were carers and people delivering the interventions aware of participants' assigned intervention during the trial? | Y | |
| 2.3. If Y/PY/N to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? | PN | The control group was exercising too. They were exercising at a center. Deviations due to trial context are very unlikely. |
| 3.4. If Y/PY to 2.3: Were these deviations likely to have affected the outcome? | NA | |
| 2.5. If Y/PY/N to 2.4: Were these deviations from intended intervention balanced between groups? | NA | |
| 2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention? | Y | Yes. They used a Modified ITT. The researchers don't exclude anyone nor are anyone analyzed in the wrong group. |
| 2.7. If Y/PY/N to 2.6: Were there potential for a substantial impact (on the result) of the failure to analyze participants in the group to which they were randomized? | NA | |
| **Risk of bias judgement** | | Low | |

#### Bias due to missing outcome data

| Domain | Signalling question | Response | Comments |
|--------|--------------------|----------|----------|
| 3.1 Were data for this outcome available for all, or nearly all, participants randomized? | N | NPN dropped out (1.95% P continuous outcome); 2 dropped for PT group and 3 from Control due to "family and personal reasons". |
| 3.2 If N/PN to 3.1: Is there evidence that result was not biased by missing outcome data? | N | No, they did not perform any imputation or sensitivity analysis. |
| 3.3. If N/PN to 3.2: Could missingness in the outcome depend on its true value? | PN | No. Although differential drop-out, reasons were due to family and personal reasons and hence unrelated to the outcome. Also greater drop-outs in the control group than intervention. |
| 3.4. If Y/PY to 3.3: Is it likely that missingness in the outcome depended on its true value? | NA | |
| **Risk of bias judgement** | | Low | |

#### Bias in measurement of the outcome

| Domain | Signalling question | Response | Comments |
|--------|--------------------|----------|----------|
| 4.1 Was the method of measuring the outcome inappropriate? | N | Had validated and sensitive measures. |
| 4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? | N | Outcome measurement (data collection) involve the same measurement methods and thresholds, used at comparable time points. |
| 4.3. If Y/PY/N to 4.2: Were outcome assessors aware of the intervention received by study participants? | N | Assessors are blinded is not reported in the paper. But email from author says single blind. |
| 4.4. If Y/PY/N to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received? | NA | |
| 4.5. If Y/PY/N to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received? | NA | |
| **Risk of bias judgement** | | Low | |

#### Bias in selection of the reported result

| Domain | Signalling question | Response | Comments |
|--------|--------------------|----------|----------|
| 5.1 Were the data that produced this result analyzed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis? | N | No pre-specified analysis or protocol mentioned |
| 5.2... multiple eligible outcome measurements (e.g., scales, definitions, time points) within the outcome domain? | N | Standard scales used at final time point. Reported functional outcomes. For less, chair stand and get up and go required for meta. |
| 5.3... multiple eligible analyses of the data? | N | Performed using a p - 2 (between within analysis of variance [time (preass) and postint) 2 group (PT and TBI) with a least significant difference (LSD) post hoc procedure. Reported the post values. |
| **Risk of bias judgement** | | Low | |

#### Overall bias

| Domain | Signalling question | Response | Comments |
|--------|--------------------|----------|----------|
| **Risk of bias judgement** | | Some concerns | |

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| Bias due to deviations from intended interventions | Y | Participants and Interventionists were aware. |
|--------------------------------------------------|---|-----------------------------------------------|
| 2.1 Were participants aware of their assigned intervention during the trial? | Y | Participants and Interventionists were aware. |
| 2.2 Were carers and people delivering the interventions aware of participants’ assigned intervention during the trial? | Y | Participants and Interventionists were aware. |
| 2.3 If Y/PY/N to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? | N | The control group was exercising too. They were exercising at a center. Deviations due to trial context are very unlikely. |
| 2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome? | NA | |
| 2.5. If Y/PY/N to 2.4: Were these deviations from intended intervention balanced between groups? | NA | |
| 2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention? | Y | Yes, they used a Modified ITT. The researchers didn’t exclude anyone nor were anyone analyzed in the wrong group. |
| 2.7 If N/PN/N to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized? | NA | |
| Risk of bias judgement | Low | |
| Bias due to missing outcome data | Y | No drop outs reported in the final 6 weeks |
| 3.1 Were data for this outcome available for all, or nearly all, participants randomized? | Y | No drop outs reported in the final 6 weeks |
| 3.2 If N/PN/N to 3.1: Is there evidence that result was not biased by missing outcome data? | NA | |
| 3.3 If Y/PY/N to 3.2: Could missingness in the outcome depend on its true value? | NA | |
| 3.4 If Y/PY/N to 3.3: Is it likely that missingness in the outcome depended on its true value? | NA | |
| Risk of bias judgement | Low | |
| Bias in measurement of the outcome | N | Valid measures |
| 4.1 Was the method of measuring the outcome inappropriate? | N | Valid measures |
| 4.2 Could measurement or ascertainment of the outcome have differed between intervention-groups? | PN | Outcome measurement (data collection) involves the same measurement methods and thresholds, used at comparable time points. |
| 4.3 Were outcome assessors aware of the intervention received by study participants? | N | Author email said “evaluators were blinded” (S Correa) |
| 4.4 If Y/PY/N to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received? | NA | |
| 4.5 If Y/PY/N to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received? | NA | |
| Risk of bias judgement | Low | Changed to some concerns since we are unsure of the blinding. No response from authors. |
| Bias in selection of the reported result | NA | Just post data at 12 weeks. Reported functional outcomes. For ex, chair stand required for meta. |
| 5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalised before unbinned outcome data were available for analysis? | NA | No pre-specified analysis or protocol mentioned |
| 5.2... multiple eligible outcome measurements (e.g. scales, definitions, time-points) within the outcome domain? | N | Just post data at 12 weeks. Reported functional outcomes. For ex, chair stand required for meta. |
| 5.3... multiple eligible analyses of the data? | N | 2-way repeated measures analysis of variance (ANOVA) was used (2 groups x 3 times), with Bonferroni post-hoc tests. Reported raw post scores |
| Risk of bias judgement | Low | |
| Overall bias | Risk of bias judgement | Some concerns |
| Bias due to missing outcome data | 3.2 If Y/PY to 3.1: Is there evidence that result was not biased by missing outcome data? | N | No sensitivity or imputations performed for missing outcome. |
|----------------------------------|------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------|
|                                  | 3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value? | PY | Although differential drop-out, only 2 drop-outs related to outcome (10%) and the rest unrelated. |
|                                  | 3.4 If Y/PY to 3.3: Is it likely that missingness in the outcome depended on its true value? | PN | N/A |

| Risk of bias judgement | Some concerns |

| Bias in measurement of the outcome | 4.1 Was the method of measuring the outcome inappropriate? | N | Yes, valid measures. |
|-----------------------------------|----------------------------------------------------------|---|----------------------------------------------------------------|
|                                   | 4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? | N | Outcome measurement (data collection) involve same measurement methods and thresholds, used at comparable time points |
|                                   | 4.3 Were outcome assessors aware of the intervention received by study participants? | PN | Assessors being blind reported in pre-reg; but not mentioned in paper |
|                                   | 4.4 If Y/PY to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received? | NA | N/A |
|                                   | 4.5 If Y/PY to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received? | NA | N/A |

| Risk of bias judgement | Low |

| Bias in selection of the reported result | 5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis? | Y | Preregistration available, but not SAP |
|----------------------------------------|-------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------|
|                                       | 5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain? | PN | Final time point and SPPB. Reported functional outcomes. SPPB required for meta. |
|                                       | 5.3 ... multiple eligible analyses of the data? | PN | All national trial level included; appropriate for repeated measured data, used to analyze continuous data in the main and secondary outcome variables. Reported pred scores for SPPB |

| Risk of bias judgement | Low |

| Overall bias | Risk of bias judgement | Some concerns |

| Unique ID | 4 |
|-----------|------------------------|
| Study ID  | Hanwood                |
| Assessor  | Hanwood, Aim, assignment to intervention (the 'intention-to-treat' effect) |

| Ref or Label | Hanwood |
|-------------|---------|
| Experimental | Power, Comparator (Control) |
| Outcome     | Physical Function, Results |
| Weight      | 1 |

| Domain | Signalling question | Response | Comments |
|--------|---------------------|----------|----------|
| Bias arising from the randomization process | 1.1 Was the allocation sequence random? | NI | N/A |
| | 1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions? | NI | N/A |
| | 1.3 Did baseline differences between intervention groups suggest a problem with the randomization process? | N | No major baseline differences |

| Risk of bias judgement | Some concerns |

| Bias due to deviations from intended interventions | 2.1. Were participants aware of their assigned intervention during the trial? | Y | Yes, both participants and interventionists were aware of the groups |
|--------------------------------------------------|---------------------------------------------------------------------------|---|----------------------------------------------------------------|
|                                                  | 2.2. Were carees and people delivering the interventions aware of participants' assigned intervention during the trial? | PY | N/A |
|                                                  | 2.3. If Y/PY to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? | PN | The control group was exercising too. They were exercising at a center. Deviations due to trial context are very unlikely. |
|                                                  | 2.4. If Y/PY to 2.3: Were these deviations likely to have affected the outcome? | NA | N/A |
|                                                  | 2.5. If Y/PY to 2.4: Were these deviations from intended intervention balanced between groups? | NA | N/A |
|                                                  | 2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention? | Y | Yes. They used a Modified ITT. The researchers didn't exclude anyone nor were anyone analyzed in the wrong group |
|                                                  | 2.7. If N/PN to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyze participants in the group to which they were randomized? | NA | N/A |

| Risk of bias judgement | Low |

| Bias due to missing outcome data | 3.1 Were data for this outcome available for all, or nearly all, participants randomized? | PN | 4 dropped and 1 from the control, 15% drop out. |
|----------------------------------|------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------|
|                                  | 3.2 If Y/PY to 3.1: Is there evidence that result was not biased by missing outcome data? | PN | No. They did not perform any imputation or sensitivity analysis. |
|                                  | 3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value? | PN | No. Although differential drop-out, "no participants indicated that the training protocol or intensity was the reason for leaving the study". So missing likely not related to the outcome |
|                                  | 3.4 If Y/PY to 3.3: Is it likely that missingness in the outcome depended on its true value? | NA | N/A |

| Risk of bias judgement | Low |

| Bias in measurement of the outcome | 4.1 Was the method of measuring the outcome inappropriate? | N | Outcome measurement (data collection) involve same measurement methods and thresholds, used at comparable time points |
|-----------------------------------|----------------------------------------------------------|---|----------------------------------------------------------------|
|                                   | 4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? | N | N/A |
|                                   | 4.3 Were outcome assessors aware of the intervention received by study participants? | NI | N/A |
|                                   | 4.4 If Y/PY to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received? | PY | Yes, outcome involves use of a stop watch and verbal encouragement can affect outcome. We are unsure if blinding was implemented; hence we rated it as "some concerns" |
|                                   | 4.5 If Y/PY to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received? | PN | N/A |

| Risk of bias judgement | Low |

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### Risk of bias judgement

#### Bias in selection of the reported result

- 5.1. Were the data that produced the result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?
  - **NI**: No pre-specified analysis or protocol mentioned

- 5.2. *...* multiple eligible outcome measurements (e.g., scales, definitions, time-points) within the outcome domain?
  - **PN**: Standard scales used at one time point. Reported functional outcomes. For ex., chair stand and stair climb and go required for meta.

- 5.3. *...* multiple eligible analyses of the data?
  - **PN**: A two-way (Group * Time) repeated measures analysis of covariance (ANCOVA) adjusted for age. Adjusted scores given and not raw scores.

#### Overall bias

- **Risk of bias judgement**: Some concerns

### Unique ID

| Ref or Label | Study ID | Assessor |
|--------------|----------|----------|
| Source       | Journal article(s) |        |

### Experimental

| Domain       | Signaling question | Response | Comments |
|--------------|--------------------|----------|----------|
| Bias arising from the randomization process | 1.1. Was the allocation sequence random? | PY       | Used a computer-generated randomization scheme integrated into a web-based data entry and management system. Very likely concealed. |
|               | 1.2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions? | PY       |        |
|               | 1.3. Did baseline differences between intervention groups suggest a problem with the randomization process? | N        | No imbalances are apparent or observed imbalances are compatible with chance. |
| Bias due to deviations from intended interventions | 2.1. Were participants aware of their assigned intervention during the trial? | Y        | Yes, both participants and interventionists were aware of the groups. |
|               | 2.2. Were camers and people delivering the interventions aware of participants’ assigned intervention during the trial? | Y        |        |
|               | 2.3. Did Y/PY to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? | PN       | The control group was exercising in the laboratory while the intervention group were exercising at a center. Deviations due to trial context are very unlikely. |
|               | 2.4. Did Y/PY to 2.3: Were these deviations likely to have affected the outcome? | NA       |        |
|               | 2.5. Did Y/PY to 2.4: Were these deviations from intended intervention balanced between groups? | NA       |        |
|               | 2.6. Did Y/PY to 2.5: Was there potential for a substantial impact (on the result) of the failure to randomize participants to the group to which they were randomized? | Y        | Yes. They used a Modified ITT. The researchers didn’t exclude anyone. |
| Bias due to missing outcome data | 3.1. Were data for this outcome available for all, or nearly all, participants randomized? | N        | Around 25% in I and 33% in C drop out in each group. 30% in total. |
|               | 3.2. Did Y/PY to 3.1: Is there evidence that result was not biased by missing outcome data? | PN       | As they did not perform any imputation or sensitivity analysis. |
|               | 3.3. Did Y/PY to 3.2: Could missingness in the outcome depend on its true value? | PN       | Missing was not related to true value. More dropped from control. None of the drop outs were related to the intervention.” All AEs and SAEs and did not attribute any of them to the interventions. |
| Bias in measurement of the outcome | 4.1. Was the method of measuring the outcome inappropriate? | N        | Outcome measurement (data collection) involves the same measurement methods and thresholds, used at comparable time points. |
|               | 4.2. Could measurement or ascertainment of the outcome have differed between intervention groups? | N        |        |
|               | 4.3. Were outcome assessors aware of the intervention received by study participants? | N        | Assessors blinded to group outcomes. Emailled by the author. |
|               | 4.4. Did Y/PY to 4.3: Could ascertainment of the outcome have been influenced by knowledge of intervention received? | NA       |        |
|               | 4.5. Did Y/PY to 4.4: Is it likely that ascertainment of the outcome was influenced by knowledge of intervention received? | NA       |        |

#### Overall bias

- **Risk of bias judgement**: Low
| Domain | Signalling question | Response | Comments |
|--------|---------------------|----------|---------|
| Bias arising from the randomization process | 1.1 Was the allocation sequence random? | Y | No about concealment. Just mentioned “randomly assigned to one of three”, using a random numbers generator. |
| | 1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions? | NI | |
| | 1.3 Did baseline differences between intervention groups suggest a problem with the randomization process? | PY | Sample sizes for 3 groups very different. (41,34 and 24) |
| Risk of bias judgement | High | | |
| Bias due to deviations from intended interventions | 2.1 Were participants aware of their assigned intervention during the trial? | Y | Yes, both participants and interventionists were aware of the groups |
| | 2.2 Were carers and people delivering the interventions aware of participants’ assigned intervention during the trial? | PY | |
| | 2.3, 8 Y/PY/N to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? | PN | The control group that exercising lost -rapy while exercising at a community center. Deviations due to trial context are very unlikely. supervised by a member of the research team |
| | 2.4 Y/PY to 2.3: Were these deviations likely to have affected the outcome? | NA | |
| | 2.5, 9 Y/PY/N to 2.4: Were these deviations from intended intervention balanced between groups? | NA | |
| | 2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention? | PY | Yes. They used a Modified ITT. The researchers didn’t exclude anyone nor were anyone analysed in the wrong group |
| | 2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized? | NA | |
| Risk of bias judgement | Low | | |
| Bias due to missing outcome data | 3.1 Were data for this outcome available for all, or nearly all, participants randomized? | N | |
| | 3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data? | PN | No they did not perform any imputation or sensitivity analysis. |
| | 3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value? | PN | There was a 17% difference in drop outs between the groups. But the most common reasons for dropping out were lack of interest, health issues, and scheduling conflicts. Highest drop out was in the control group. |
| | 3.4 Y/PY/N to 3.3: Is it likely that missingness in the outcome depended on its true value? | NA | |
| Risk of bias judgement | Low | | |
| Bias in measurement of the outcome | 4.1 Was the method of measuring the outcome inappropriate? | PN | Not validated and sensitive measure. |
| | 4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? | PN | Outcome measurement (data collection) involve the same measurement methods and thresholds, used at comparable time points. |
| | 4.3 Were outcome assessors aware of the intervention received by study participants? | NI | |
| | 4.4 Y/PY/N to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received? | PY | Yes, outcome involves use of a stopwatch and verbal encouragement can affect outcome. We are unsure if blinding was implemented, hence we rated as “some concerns.” |
| | 4.5 Y/PY to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received? | PN | |
| Risk of bias judgement | Some concerns | | |
| Bias in selection of the reported result | 5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis? | NI | No pre-specified analysis or protocol mentioned. |
| | 5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain? | PN | Standard scales used at one time point. Reported functional outcomes. For ex., chair stand and get up and go required for meta. |
| | 5.3 ... multiple eligible analyses of the data? | PN | Used ANCOVA adjusted for baseline. Unsure about if adjusted scores. |
| Risk of bias judgement | Some concerns | | |
| Overall bias | Risk of bias judgement | High | |
### Bias due to deviations from intended interventions

| Question                                                                 | Risk of bias judgement |
|--------------------------------------------------------------------------|------------------------|
| 2.2 Were carers and people delivering the interventions aware of participants’ assigned intervention during the trial? | Y                      |
| 2.3. If Y/Py to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? | PN                     |
| 2.4. If Y/Py to 2.3: Were these deviations likely to have affected the outcome? | NA                     |
| 2.5. If Y/Py to 2.4: Were these deviations from intended intervention balanced between groups? | NA                     |
| 2.6. Was an appropriate analysis used to estimate the effect of assignment to intervention? | PY                     |
| 2.7. If N/PN to 2.6: Was there potential for a substantial impact (on the result of the failure to analyse participants in the group to which they were randomized)? | NA                     |

### Bias due to missing outcome data

| Question                                                                 | Risk of bias judgement |
|--------------------------------------------------------------------------|------------------------|
| 3.1 Were data for this outcome available for all, or nearly all, participants randomized? | PN                     |
| 3.2. If NP/Nn to 3.1: Is there evidence that the result was not biased by missing outcome data? | N                      |
| 3.3. If NP/Nn to 3.2: Could missingness in the outcome depend on its true value? | N                      |
| 3.4. If Y/Py to 3.3: Is it likely that missingness in the outcome depended on its true value? | N                      |

### Bias in measurement of the outcome

| Question                                                                 | Risk of bias judgement |
|--------------------------------------------------------------------------|------------------------|
| 4.1 Was the method of measuring the outcome inappropriate? | PN                     |
| 4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? | PN                     |
| 4.3. Were outcome assessors aware of the intervention received by study participants? | N                      |
| 4.4. If Y/Py to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received? | NA                    |
| 4.5. If Y/Py to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received? | NA                    |

### Bias in selection of the reported result

| Question                                                                 | Risk of bias judgement |
|--------------------------------------------------------------------------|------------------------|
| 5.1. Were the data that produced this result analysed in accordance with a prespecified analysis plan that was finalised before unblinded outcome data were available for analysis? | NA                     |

### Overall bias

| Risk of bias judgement |
|------------------------|
| High                   |

---

**Unique ID**  
**Study ID** Richardson  
**Ref or Label**  
**Experimental** Power  
**Comparator**  
**Control**  
**Source**  
**Outcome** Physical Function  
**Results**  
**Weight**  
**Domain** Signalling question  
**Response**  
**Comments**

| Bias arising from the randomization process | Response | Comments |
|-------------------------------------------|----------|----------|
| 1.1 Was the allocation sequence random? | PY       | No info about method of randomization or concealment. Just says "randomly allocated". |
| 1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions? | NI       | No information about methods of randomization. |
| 1.3 Did baseline differences between intervention groups suggest a problem with the randomization process? | PN       | No imbalances are apparent or observed imbalances are compatible with chance. |

| Bias due to deviations from intended interventions | Risk of bias judgement |
|---------------------------------------------------|------------------------|
| 2.1 Were carers aware of their assigned intervention during the trial? | Y                      |
| 2.2. Were carers and people delivering the interventions aware of participants’ assigned intervention during the trial? | Y                      |
| 3.3. If Y/Py to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? | PN                     |
| 2.4. If Y/Py to 2.3: Were these deviations likely to have affected the outcome? | NA                     |
| 2.5. If Y/Py to 2.4: Were these deviations from intended intervention balanced between groups? | NA                     |
| 2.6. Was an appropriate analysis used to estimate the effect of assignment to intervention? | PC                     |
| 2.7. If N/PN to 2.6: Was there potential for a substantial impact (on the result of the failure to analyse participants in the group to which they were randomized)? | NA                     |

| Risk of bias judgement |
|------------------------|
| Low                   |

| Bias due to missing outcome data | Risk of bias judgement |
|---------------------------------|------------------------|
| 3.1 Were data for this outcome available for all, or nearly all, participants randomized? | NA                     |
| 3.2. If NP/Nn to 3.1: Is there evidence that the result was not biased by missing outcome data? | NA                     |

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### Bias in measurement of the outcome

| Question                                                                 | Response | Comments |
|--------------------------------------------------------------------------|----------|----------|
| 4.1 Was the method of measuring the outcome inappropriate?               | N        | Not validated and sensitive measures. |
| 4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? | PN       | Outcome measurement (data collection) in the same measurement methods and thresholds, used at comparable time points. |
| 4.3 Were outcome assessors aware of the intervention received by study participants? | Y        | Assessors were not blinded to groups stated in paper. |
| 4.4 8 Y/PY/N to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received? | PY       | Yes, outcome involves use of a stop watch and verbal encouragement can affect outcome. |
| 4.5 8 Y/PY/N to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received? | PY       | Yes, outcome involves use of a stop watch and verbal encouragement can affect outcome. |

### Bias in selection of the reported results

| Question                                                                 | Response | Comments |
|--------------------------------------------------------------------------|----------|----------|
| 5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis? | No       | No pre-specified analysis or protocol mentioned. |
| 5.2 ... multiple eligible outcome measurements (e.g., scales, definitions, time points) within the outcome domain? | PN       | Standard scales used at one time point. Reported functional outcomes. For e.g. chair stand and 9 ft up and go required for meta. |
| 5.3 ... multiple eligible analyses of the data?                          | PN       | ANCOVA performed. But unadjusted scores reported. TUG not significant. |

### Overall bias

| Question | Response | Comments |
|----------|----------|----------|
| Risk of bias judgement | High | High |
### Bias in selection of the reported result

| Question                                                                 | Response | Comments |
|-------------------------------------------------------------------------|----------|----------|
| 5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unlimited outcome data were available for analysis? | NI       | No pre-specified analysis or protocol mentioned |
| 5.2 ... multiple eligible outcome measurements (e.g., scales, definitions, time points) within the outcome domain? | PN       | Standard scales used at one time point. Reported functional outcomes. For ex, chair stand and stair climb required for meta. |
| 5.3 ... multiple eligible analyses of the data?                         | N        | Two-way analysis of variance (ANOVA) with repeated measures (group vs. time). Unadjusted scores reported. |

**Risk of bias judgement:** Low

### Overall bias

**Risk of bias judgement:** Some concerns

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### Unique ID

| Study ID | Coelho-Júnior |
|----------|---------------|

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## Experimental  
Power | Comparator | Control | Source |
---|---|---|---|

### Outcome  
Physical function | Results | Weight | 1 |

## Domain  
Signalling question | Response | Comments |
---|---|---|
### Bias arising from the randomization process  
1.1 Was the allocation sequence random? | Y | "A computer-generated list of random numbers was used by an independent researcher. So it likely that it is concealed." |
1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions? | Ni |  |
1.3 Did baseline differences between intervention groups suggest a problem with the randomization process? | PN | Baseline difference exist. |

### Risk of bias judgement  
Some concerns |

### Bias due to deviations from intended interventions  
2.1 Were participants aware of their assigned intervention during the trial? | Y |  |
2.2 Were canes and people delivering the interventions aware of participants’ assigned intervention during the trial? | Y |  |
2.3. If Y/PY to 2.1 or 2.2. Were there deviations from the intended intervention that arose because of the experimental context? | PN | The control group was exercising too. They were exercising at a center. Deviations due to trial context are very unlikely |
2.4 If Y/PY to 2.3. Were these deviations likely to have affected the outcome? | NA |  |
2.5. If Y/PY to 2.4. Were these deviations from intended intervention balanced between groups? | NA |  |
2.6. If Y/PY to 2.5. Was an appropriate analysis used to estimate the effect of assignment to intervention? | PY | As Y/PY to 2.3. and Y/PY to the LSRT, withdrawn after 2 weeks because they were not randomized to the same exercise group |
2.7 If N/PN to 2.6. Was there potential for a substantial impact (on the result) of the failure to randomize participants in the group to which they were randomized? | NA |  |

### Risk of bias judgement  
Some concerns |

### Bias due to missing outcome data  
3.1 Were data for this outcome available for all, or nearly all, participants randomized? | PY | 2 dropped. Each from Power and control. 9% |
3.2 If N/PN to 3.1. Is there evidence that result was not biased by missing outcome data? | NA |  |
3.3 If N/P to 3.2. Could missingness in the outcome depend on its true value? | NA |  |
3.4 If Y/PY to 3.3. Is it likely that missingness in the outcome depended on its true value? | NA |  |

### Risk of bias judgement  
Low |

### Bias in measurement of the outcome  
4.1 Was the method of measuring the outcome inappropriate? | PN |  |
4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? | PN |  |
4.3 Were outcome assessors aware of the outcome intervention received by study participants? | Ni | No information about blinding |
4.4 If Y/PY to 4.3. Could assessment of the outcome have been influenced by knowledge of intervention received? | PY |  |
4.5 If Y/PY to 4.4. Is it likely that assessment of the outcome was influenced by knowledge of intervention received? | PY |  |

### Risk of bias judgement  
Some concerns |

### Bias in selection of the reported result  
5.1 Were the data that produced the result analyzed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis? | PN | Retrospective preplagation |
5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time-points) within the outcome domain? | PN | Standard scales used at one time point. Reported functional outcomes. For ex: get up and go required for meta-analysis. Reported post scores. |
5.3 ... multiple eligible analyses of the data? | PN | Yes. But post data reported. |

### Risk of bias judgement  
Low |

### Overall bias  
Risk of bias judgement  
Some concerns |

## Unique ID  
12  

## Study ID  
Möller  

## Möller  
Aim | assignment to intervention (the ‘intention-to-treat’ affect) | Assessor |
---|---|---|
Experimental  
Power | Comparator | Source |  |

## Outcome  
Physical Function | Results | Weight | 1 |

## Domain  
Signalling question | Response | Comments |
---|---|---|
### Bias arising from the randomization process  
1.1 Was the allocation sequence random? | Y | Participant were randomized assigned into the separate intervention groups through electronic randomization (https://www.randomizer.org) |
1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions? | PY | Concealment was guaranteed by a researcher who was blinded with respect to the participants. |
1.3 Did baseline differences between intervention groups suggest a problem with the randomization process? | PN | NO imbalances are apparent or if any observed imbalances are compatible with chance. |

### Risk of bias judgement  
Low |

### Bias due to deviations from intended interventions  
2.1 Were participants aware of their assigned intervention during the trial? | Y |  |
2.2 Were canes and people delivering the interventions aware of participants’ assigned intervention during the trial? | Y |  |

## Risk of bias judgement  
Low |

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| Bias due to deviations from intended interventions | 2.5. If Y/PYN to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? | PN | The control group was exercising too. They were exercising at a center. Deviations due to trial context are very unlikely |
| Bias due to deviations from intended interventions | 2.4. If Y/PY to 2.3: Were there deviations likely to have affected the outcome? | NA |
| Bias due to deviations from intended interventions | 2.3. If Y/PYN to 2.4: Were these deviations from intended intervention balanced between groups? | NA |
| Bias due to deviations from intended interventions | 2.2. Was an appropriate analysis used to estimate the effect of assignment to intervention? | PY | Yes. They used a Modified ITT. The researchers didn’t include anyone not anyone analyzed in the wrong group. |
| Bias due to deviations from intended interventions | 2.1. Was there potential for a substantial impact (on the result) of the failure to analyze participants in the group to which they were randomized? | NA |
| Risk of bias judgement | Bias due to missing outcome data | Low |
| Bias due to missing outcome data | 3.1 Were data for this outcome available for all, or nearly all, participants randomized? | PN | 12.5% dropped out. 3 dropped from the PT and 2 from the ST group. Merely imputation related. |
| Bias due to missing outcome data | 3.2 If N/PN to 3.1: Is there evidence that result was not biased by missing outcome data? | PN | No. They did not perform any imputation or sensitivity analysis. |
| Bias due to missing outcome data | 3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value? | PN | The drops outs were related to “non-intervention health related” and two due to professional issues |
| Bias due to missing outcome data | 3.4 If Y/PY to 3.3: Is it likely that missingness in the outcome depended on its true value? | NA |
| Risk of bias judgement | Bias in measurement of the outcome | Low |
| Bias in measurement of the outcome | 4.1 Was the method of measuring the outcome inappropriate? | N |
| Bias in measurement of the outcome | 4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? | PN |
| Bias in measurement of the outcome | 4.3 Were outcome assessors aware of the intervention received by study participants? | N | No. The intervention group was blinded regarding group allocation before the intervention and 8 and 16 weeks post-intervention. |
| Bias in measurement of the outcome | 4.4 If Y/PYN to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received? | NA |
| Bias in measurement of the outcome | 4.5 If Y/PYN to 4.4. Is it likely that assessment of the outcome was influenced by knowledge of intervention received? | NA |
| Risk of bias judgement | Bias in selection of the reported result | Low |
| Bias in selection of the reported result | 5.1 Were the data that produced the result analyzed in accordance with a pre-specified analysis plan that was finalized before unblinding outcome data were available for analysis? | NI | No pre-registration reported |
| Bias in selection of the reported result | 5.2 Were multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain? | PN | Standard scales used at one time point. Reported functional outcomes. For e.g., get up and go required for meta. Reported post scores. |
| Bias in selection of the reported result | 5.3. Were multiple eligible analyses of the data? | PN | YES. But post data reported. |
| Risk of bias judgement | Overall bias | Low |
| Overall bias | Risk of bias judgement | Low |

| Unique ID | 13 | Study ID | Montairo | Assessor |
| Ref or Label | Montairo | Aim | assignment to intervention (the intervention-to-treat) effect |
| Experimental | Power | Comparator | Control | Source |
| Outcome | Physical Function | Results | Weight |

| Domain | Signalling question | Response | Comments |
| Bias arising from the randomization process | 1.1 Was the allocation sequence random? | PY | No info about method of randomization or concealment. |
| Bias arising from the randomization process | 1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions? | NI | |
| Bias arising from the randomization process | 1.3 Did baseline differences between intervention groups suggest a problem with the randomization process? | PN | No imbalances are apparent or observed imbalances are compatible with chance. |
| Risk of bias judgement | Bias due to deviations from intended interventions | Some concerns |
| Bias due to deviations from intended interventions | 2.1. Were participants aware of their assigned intervention during the trial? | Y | |
| Bias due to deviations from intended interventions | 2.2 Were caregivers and people delivering the intervention aware of participants’ assigned intervention during the trial? | Y | |
| Bias due to deviations from intended interventions | 2.3. If Y/PYN to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context? | PN | The control group was exercising too. They were exercising at a center. Deviations due to trial context are very unlikely |
| Bias due to deviations from intended interventions | 2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome? | NA |
| Bias due to deviations from intended interventions | 2.5. If Y/PYN to 2.4: Were these deviations from intended intervention balanced between groups? | NA |
| Bias due to deviations from intended interventions | 2.6. Was an appropriate analysis used to estimate the effect of assignment to intervention? | PN | Yes. They used a Modified ITT. The researchers didn’t include anyone not anyone analyzed in the wrong group. |
| Bias due to deviations from intended interventions | 2.7 If N/PN to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyze participants in the group to which they were randomized? | PY | |
| Risk of bias judgement | Bias due to missing outcome data | High |
| Bias due to missing outcome data | 3.1 Were data for this outcome available for all, or nearly all, participants randomized? | NI | No info about drop out or missing data. All participants completed the 8 month study it appears. |
| Bias due to missing outcome data | 3.2 If N/PN to 3.1: Is there evidence that result was not biased by missing outcome data? | PN | |
| Bias due to missing outcome data | 3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value? | NI | There was no info to evaluate this info. Author emailed 10 subjects dropped |
| Bias in measurement of the outcome | Risk of bias judgement | Some concerns |
|-----------------------------------|------------------------|---------------|
| 3.4 Is it likely that missingness in the outcome depended on its true value? | NI | (25% missing), but no info on the groups from which they dropped. |
| 4.1 Was the method of measuring the outcome inappropriate? | PN | Had validated and sensitive measures. |
| 4.2 Could measurement or ascertainment of the outcome have differed between intervention groups? | PN | Outcome measurement (data collection) involve the same measurement methods and thresholds, used at comparable time points. |
| 4.3 Were outcome assessors aware of the intervention received by study participants? | N | No information about blinding. But authors email confirmed blinding. Assessors were blinded. |
| 4.4 Is it likely that assessment of the outcome was influenced by knowledge of intervention received? | NA | |
| 4.5 Is it likely that assessment of the outcome was influenced by knowledge of intervention received? | NA | |
| Risk of bias judgement | Low | |

| Bias in selection of the reported result | Risk of bias judgement | Low |
|-----------------------------------------|------------------------|-----|
| 5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis? | NI | No pre-specified analysis or protocol mentioned. |
| 5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain? | PN | Standard scales used at one time point. Reported functional outcomes. For ex. chair stand and get up and go required for meta. |
| 5.3 ... multiple eligible analyses of the data? | PN | Yes. But post data reported. |
| Risk of bias judgement | Low | |

| Overall bias | Risk of bias judgement | High |
