

Electronic Supplementary Material Appendix Tables

Table S1 Literature search strategy

English terms	“Kaatsu training”, “practical Kaatsu training”, “practical blood flow restriction training”, “blood flow restriction training”, “resistance training associated with blood flow restriction”, “strength training associated with blood flow restriction”, “low-load resistance training associated with blood flow restriction”, “low-intensity associated with blood flow restriction”, “blood flow restriction therapy”, “blood flow restriction therapies”, “BFR Therapy”, “BFR Therapies”, “Blood Flow Restriction Training”, and “Blood Flow Restriction Exercise”
Chinese terms	“血流限制” (blood flow restriction), “血流限制训练” (blood flow restriction training) and “加压训练” (Kaatsu training).
Example for Web of Science search strategy	
(TI=(((“blood Flow Restriction” OR Kaatsu) AND (Training OR Exercise)) OR BFR Therap*)) OR AB=(((“blood Flow Restriction” OR Kaatsu) AND (Training OR Exercise)) OR BFR Therap*)	

Table S2 PEDro quality assessment of the included studies.

Study	2	3	4	5	6	7	8	9	10	11	Total
Karabulut et al.2010 [9]	1	0	1	1	1	0	1	1	1	1	8
Yasuda et al.2011 [11]	1	0	1	0	0	0	1	1	1	1	6
Clark et al.2011 [14]	1	0	0	0	0	1	1	1	1	1	6
Laurentino et al.2012 [15]	1	0	1	0	0	0	1	1	1	1	6
Kim et al.2012 [64]	1	0	1	0	0	0	1	1	1	1	6
Kim et al.2009 [40]	1	0	1	0	0	0	1	1	1	1	6
Martin-Hernandez et al.2013 [12]	1	0	1	0	0	0	1	1	1	1	6
Thiebaud et al.2013 [58]	0	0	1	0	0	0	1	1	1	1	5
Ozaki et al.2013 [16]	1	0	1	0	0	0	1	1	1	1	6
Lixandrao et al.2015 [47]	1	0	0	0	0	0	1	1	1	1	5
Ellefsen et al.2015 [17]	1	0	0	0	0	1	1	1	1	1	6
Vechin et al.2015 [13]	1	0	0	0	0	0	1	1	1	1	5
Cook et al.2017 [34]	1	0	0	0	0	1	1	1	1	1	6
Kim et al.2017a [41]	1	0	1	0	0	0	1	1	1	1	6
Sousa et al.2017 [55]	1	0	1	0	0	0	1	1	1	1	6
Kim et al.2017b [42]	1	0	1	0	0	0	1	1	1	1	6
Jessee et al.2018 [39]	1	0	1	0	0	1	1	1	1	1	7
Laswati et al.2018 [44]	1	0	1	0	0	0	1	1	1	1	6
Letieri et al.2018 [45]	1	1	1	1	0	0	1	1	1	1	8
Cook et al.2018 [35]	1	0	1	0	0	0	1	1	1	1	6
Luebbers et al.2019 [48]	1	0	1	0	0	0	1	1	1	1	6
Shiromaru et al.2019 [54]	1	0	1	0	0	1	1	1	1	1	7
Centner et al.2019 [33]	1	1	1	0	0	1	0	1	1	1	7
Bjornsen et al.2019 [26]	1	0	1	0	0	1	1	1	1	1	7
de Lemos Muller et al.2019 [37]	1	0	0	0	0	0	1	1	1	1	5
Ramis et al.2020 [52]	1	0	1	0	0	1	1	1	1	1	7
Sharifi et al.2020 [53]	1	0	0	0	0	0	1	1	1	1	5
Buckner et al.2020 [32]	1	0	1	0	0	1	1	1	1	1	7
Teixeira et al.2020 [57]	1	0	1	0	0	0	0	1	1	1	5
Fernandes et al.2020 [38]	1	0	1	0	0	0	1	1	1	1	6
Davids et al.2021 [36]	1	0	1	0	0	1	1	1	1	1	7
Morley et al.2021 [51]	1	0	1	0	0	0	0	1	1	1	5
Mendonca et al.2021 [50]	1	0	1	0	0	0	1	1	1	1	6
Kataoka et al.2022 [63]	1	0	1	0	0	1	1	1	1	1	7
Korkmaz et al.2022 [43]	0	0	1	0	0	1	1	1	1	1	6
Centner et al.2022 [28]	1	0	1	0	0	1	0	1	1	1	6
May et al.2022 [49]	1	0	1	0	0	0	1	1	1	1	6
Libardi et al.2015 [46]	1	0	1	0	0	0	0	1	1	1	5
LI Zhiyuan et al.2019 [18]	1	0	1	0	0	0	0	1	1	1	5
WANG Mingbo et al.2019 [61]	1	0	1	0	0	0	0	1	1	1	5
LI Zhiyuan et al.2022 [60]	1	0	1	0	0	0	0	1	1	1	5
LI Shanghua et al.2020 [59]	1	0	1	0	0	0	0	1	1	1	5
ZHANG Junjie et al.2022 [62]	1	0	1	0	0	0	0	1	1	1	5

CHE Tongtong et al.2022 [19]	1	0	1	0	0	0	0	1	1	1	5
Sugiarto et al.2017 [56]	1	0	1	0	0	0	0	1	1	1	5
Kubo et al.2006 [10]	1	0	1	0	0	0	0	1	1	1	5
Centner et al.2023[65]	1	0	1	0	0	1	1	1	1	1	7
De Araujo et al.2023[66]	1	1	1	1	0	1	0	1	1	1	8
Horiuchi et al.2023[67]	1	0	1	0	0	0	1	1	1	1	6
Judd et al.2023[68]	1	0	1	0	0	0	1	1	1	1	6
Reece et al.2023[69]	1	0	1	0	0	0	1	1	1	1	6
Sousa-Silva et al.2023[70]	1	1	1	0	0	1	1	1	1	1	8
Wang et al.2023[71]	1	0	1	0	0	0	1	1	1	1	6

1 = criterion is satisfied; 0 = criterion not satisfied

2 = subjects were randomly allocated to groups (in a crossover study, subjects were randomly allocated and order in which treatments were received

3 = allocation was concealed

4 = the groups were similar at baseline regarding the most important prognostic indicators

5 = there was blinding of all subjects

6 = there was blinding of all therapists who administered the therapy

7 = there was blinding of all assessors who measured at least one key outcome

8 = measures of at least one key outcome were obtained from more than 85% of the subjects initially allocated to groups

9 = all subjects from whom outcome measures were available received the treatment or control condition as allocated or, where this was not the case, data for at least one key outcome were analyzed by “intention to treat”

10 = the results of between-group statistical comparisons were reported for at least one key outcome

11 = the study provided both point measures and measures of variability for at least one key outcome

Electronic Supplementary Material Appendix Figures

Fig. S1 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle strength according to gender in the trained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *1rm* 1RM test, *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *HL-RT* high-load resistance training.

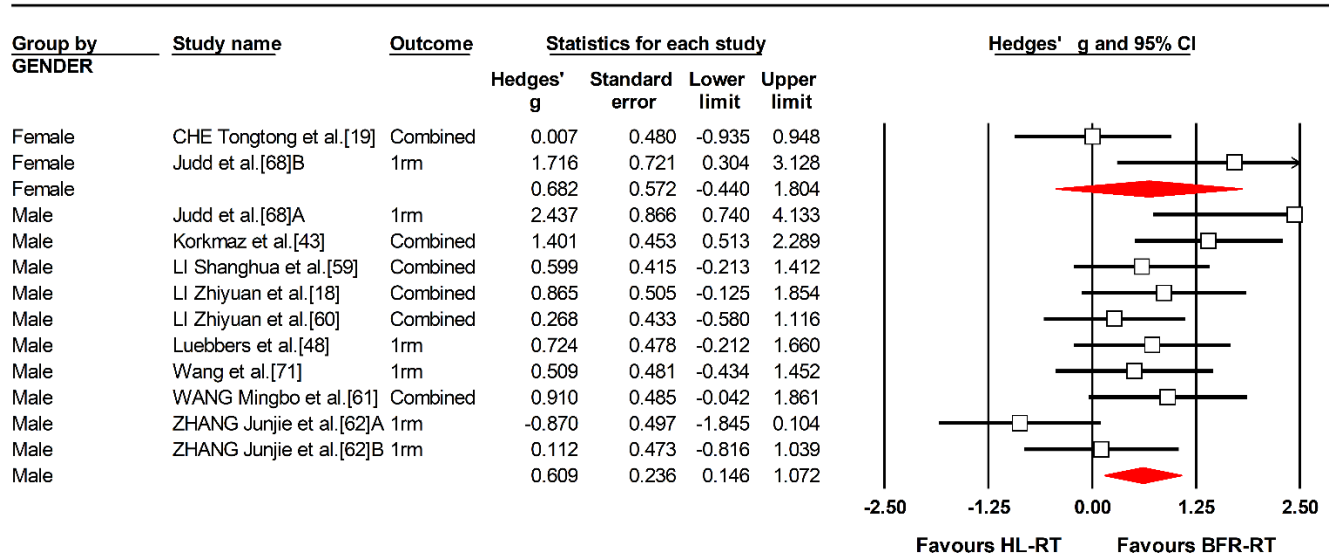


Fig. S2 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle strength according to limbs in the trained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *1rm* 1RM test, *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *HL-RT* high-load resistance training.

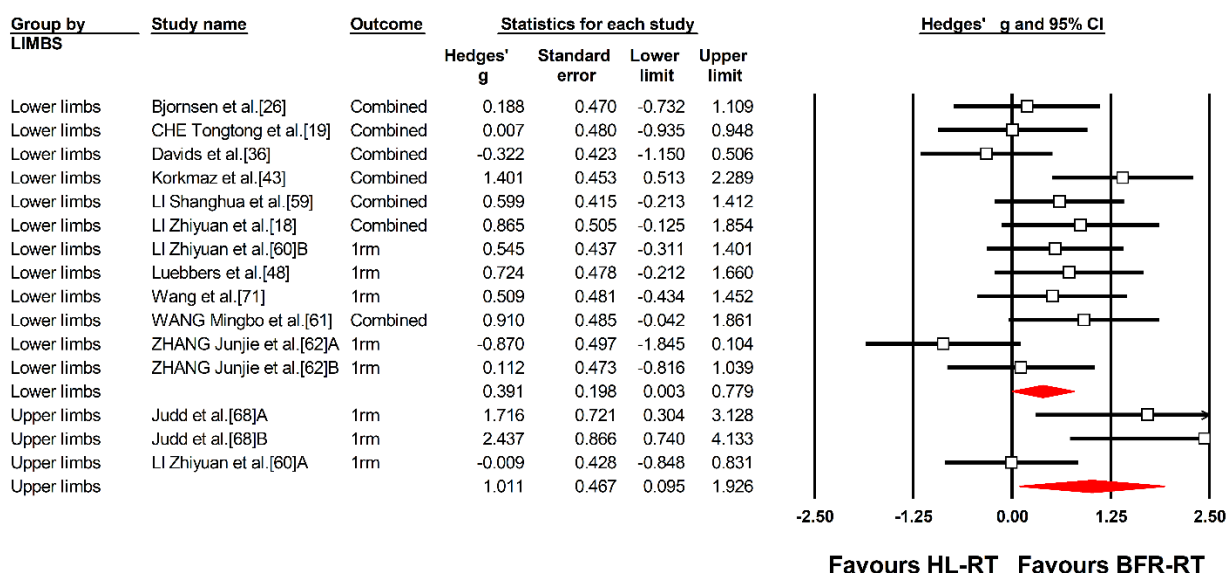


Fig. S3 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle strength according to training duration in the trained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *1rm* 1RM test, *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *HL-RT* high-load resistance training.

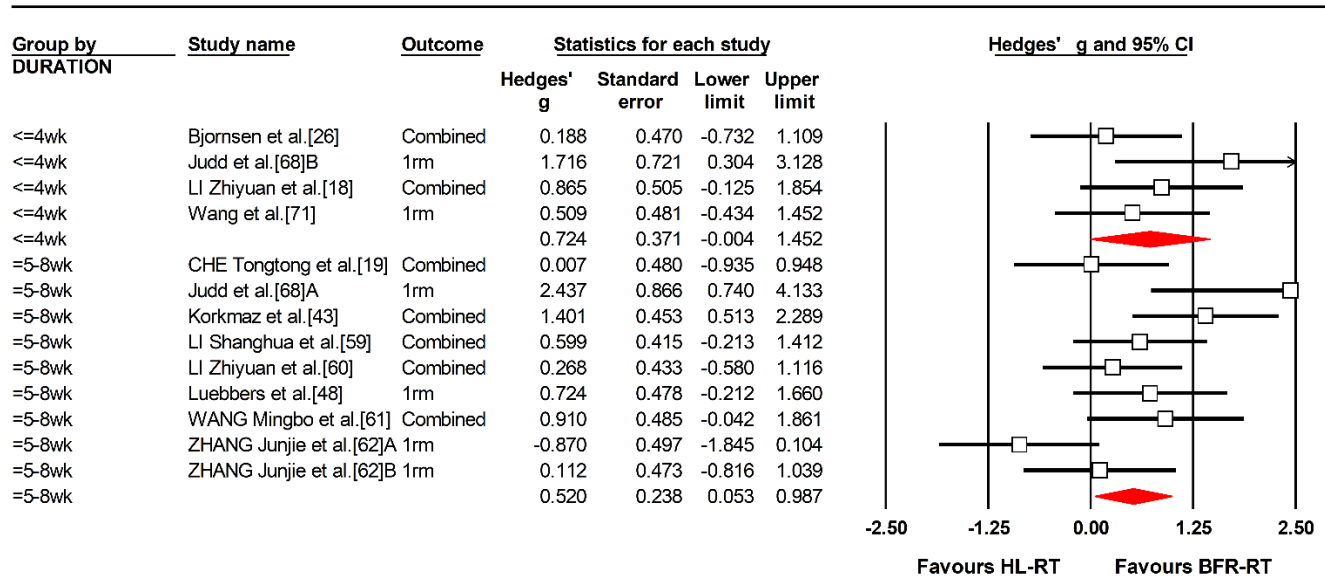


Fig. S4 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle strength according to training frequency in the trained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *1rm* 1RM test, *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *HL-RT* high-load resistance training.

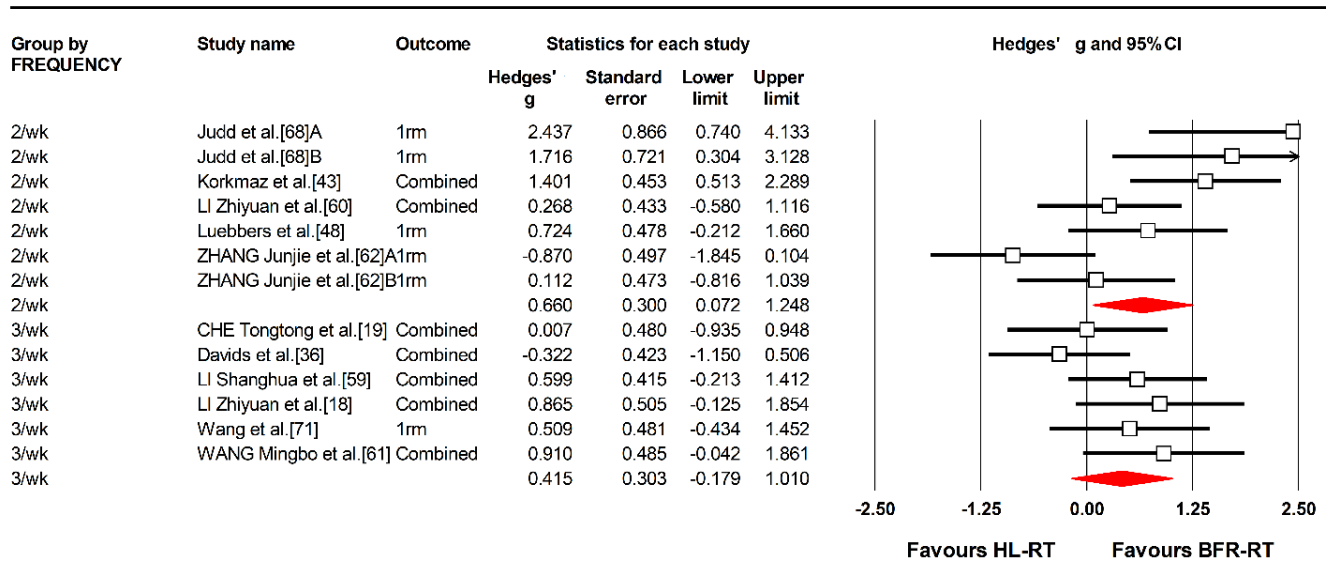


Fig. S5 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle strength according to test specificity in the trained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *1rm* 1RM test, *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *HL-RT* high-load resistance training, *mvc* isometric or isokinetic tests, *-ns* non-specific test, *-s* specific test.

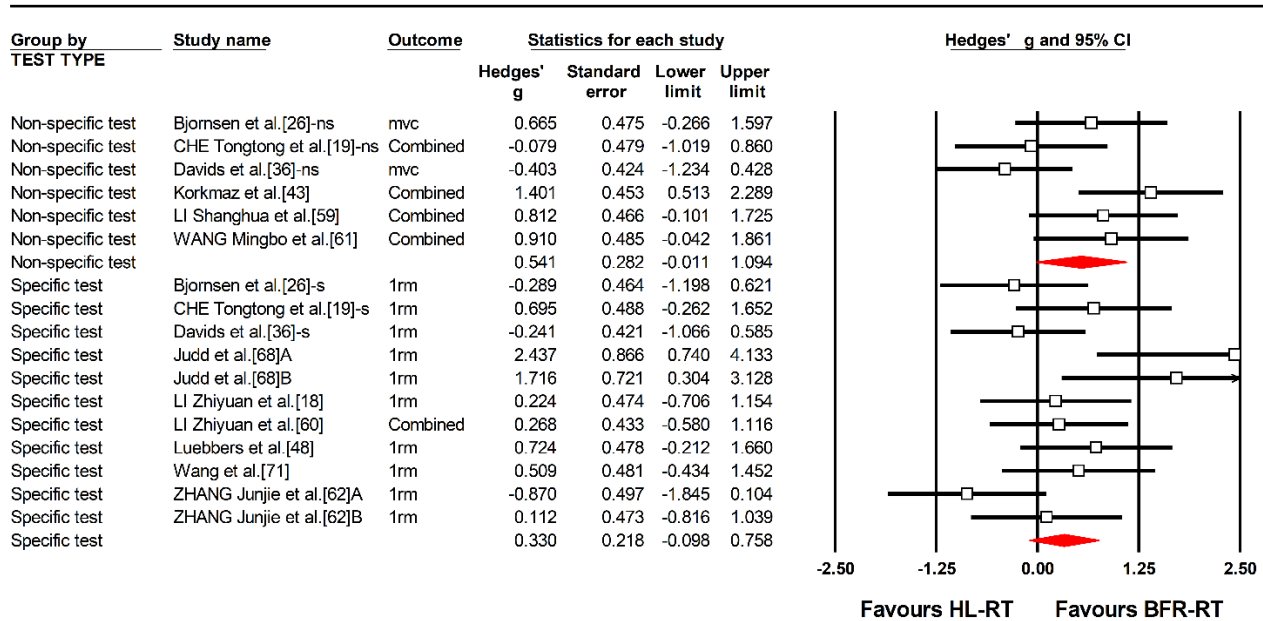


Fig. S6 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle strength according to gender in the untrained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *1rm* 1RM test, *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *HL-RT* high-load resistance training, *mvc* isometric or isokinetic tests.

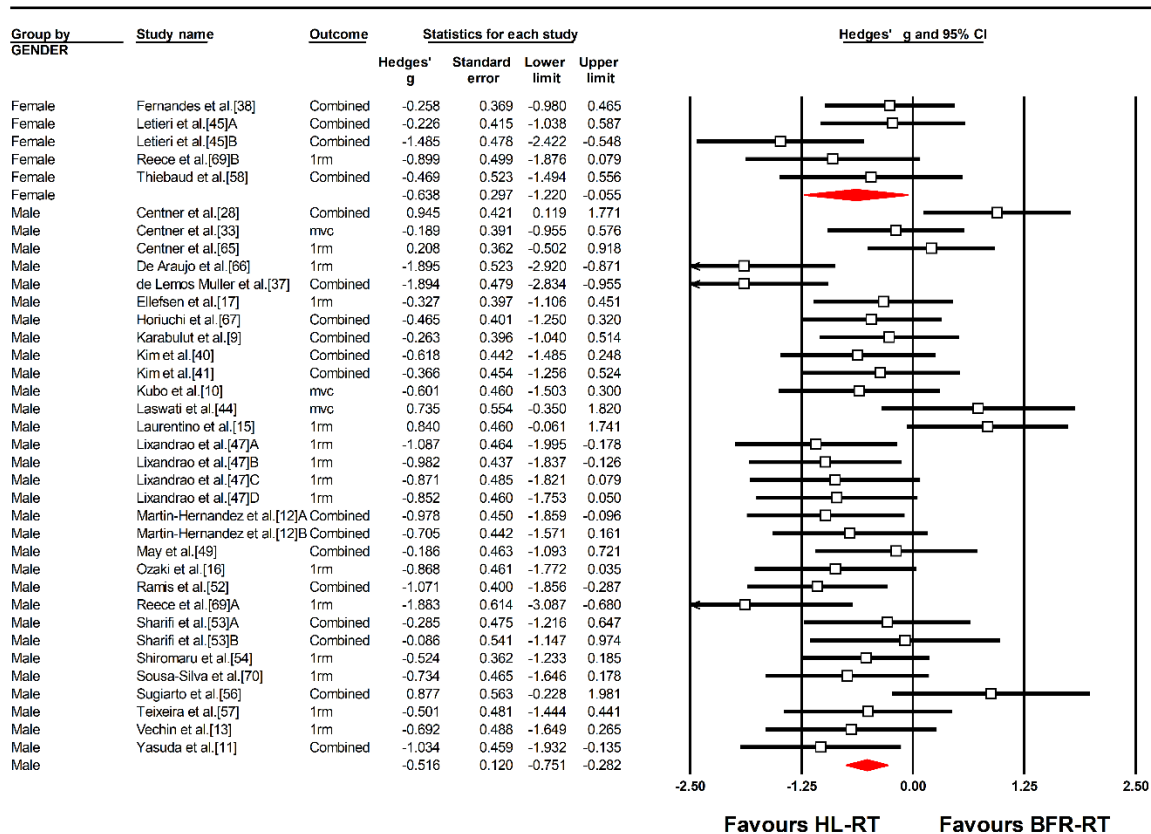


Fig. S7 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle strength according to age in the untrained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *1rm* 1RM test, *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *HL-RT* high-load resistance training, *mvc* isometric or isokinetic tests.

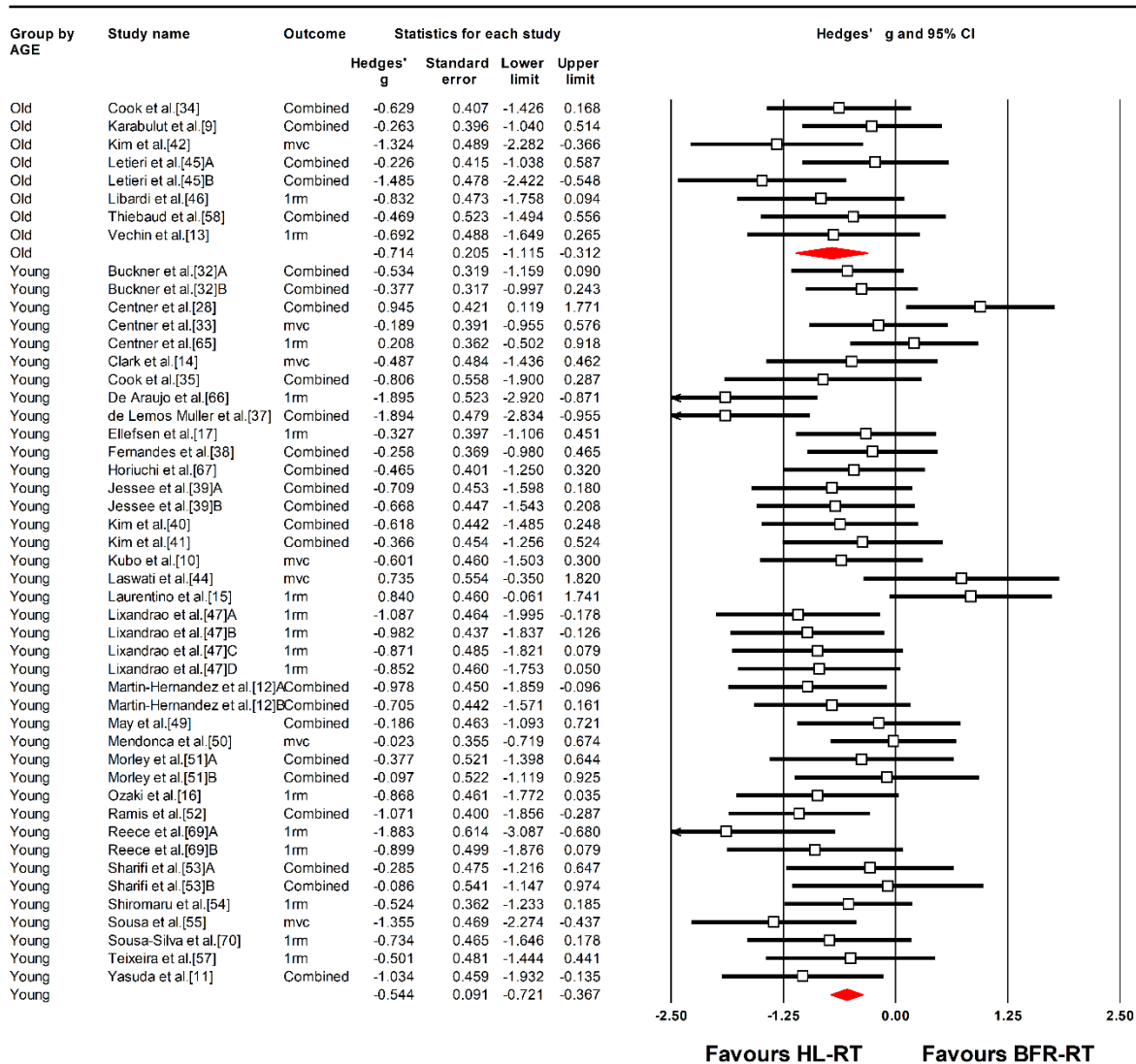


Fig. S8 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle strength according to limbs in the untrained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *1rm* 1RM test, *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *HL-RT* high-load resistance training, *mvc* isometric or isokinetic tests, *-l* lower limbs, *-u* upper limbs.

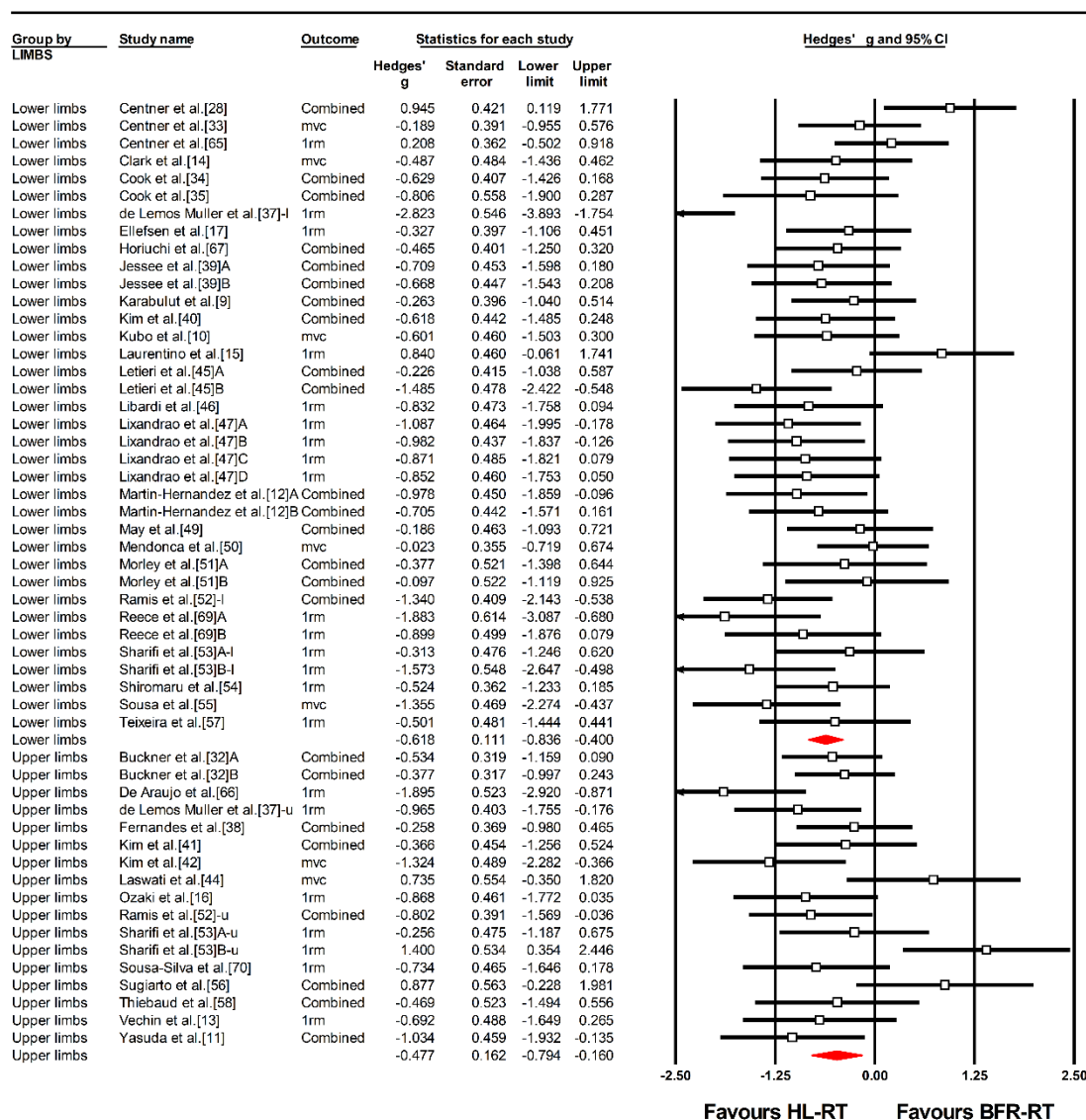


Fig. S9 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle strength according to training duration in the untrained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. 1rm 1RM test, BFR-RT blood-flow restriction low-load resistance training, CI confidence interval, Combined mean of multiple outcomes from the same training protocol, HL-RT high-load resistance training, mvc isometric or isokinetic tests.

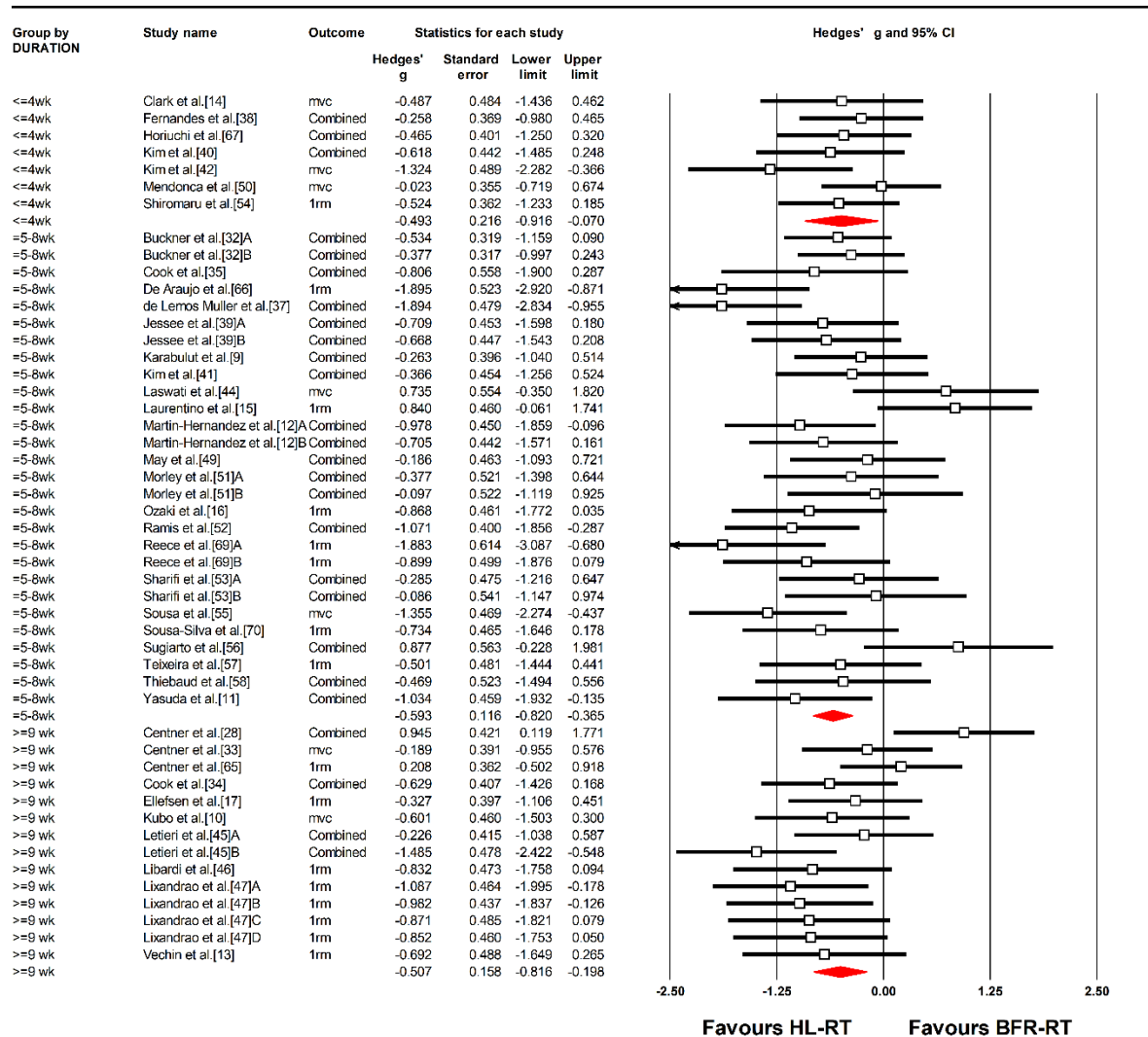


Fig. S10 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle strength according to training frequency in the untrained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *1rm* 1RM test, *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *HL-RT* high-load resistance training, *mvc* isometric or isokinetic tests.

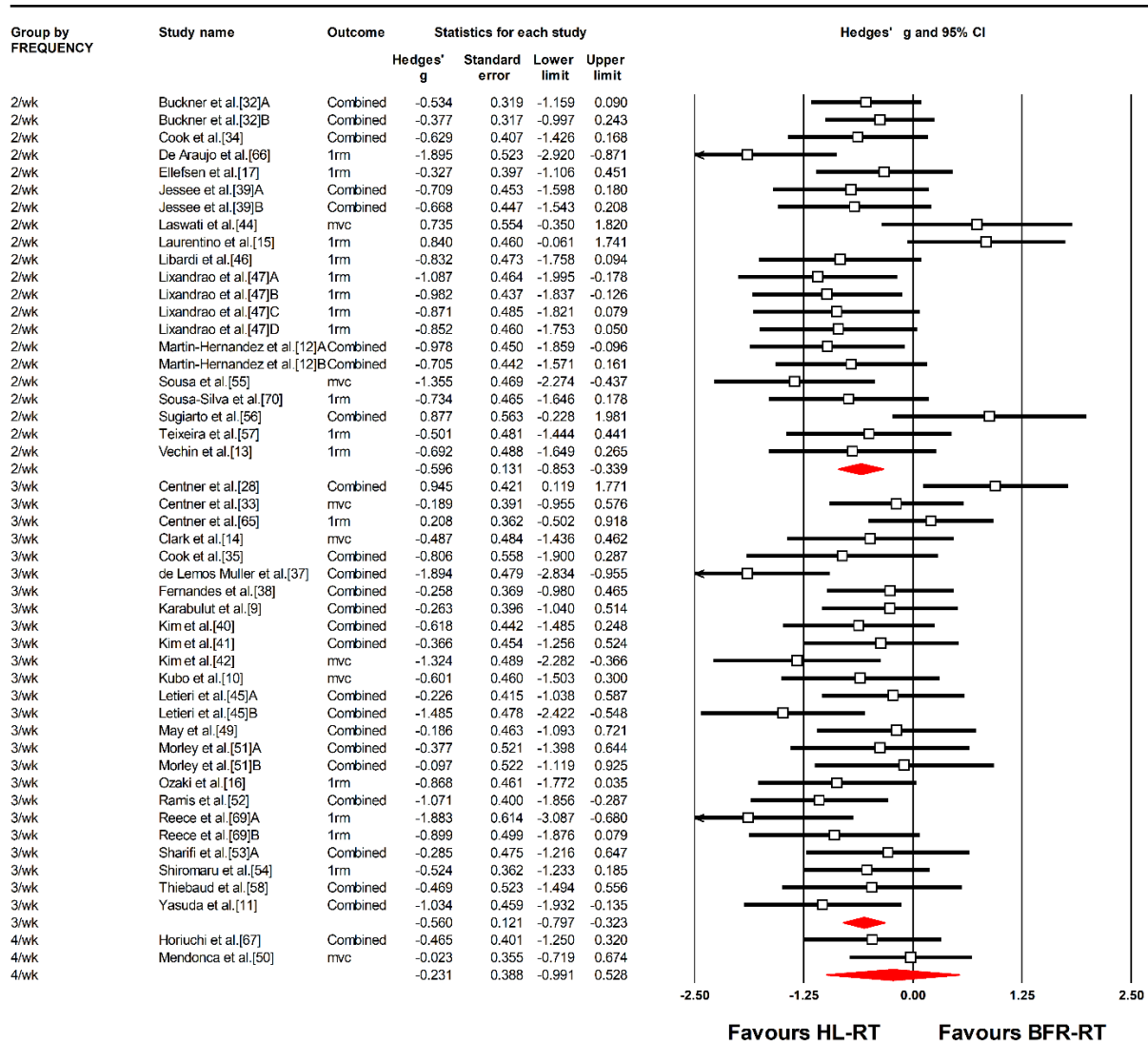


Fig. S11 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle strength according to test specificity in the untrained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *1rm* 1RM test, *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *HL-RT* high-load resistance training, *mvc* isometric or isokinetic tests, *-ns* non-specific test, *-s* specific test.

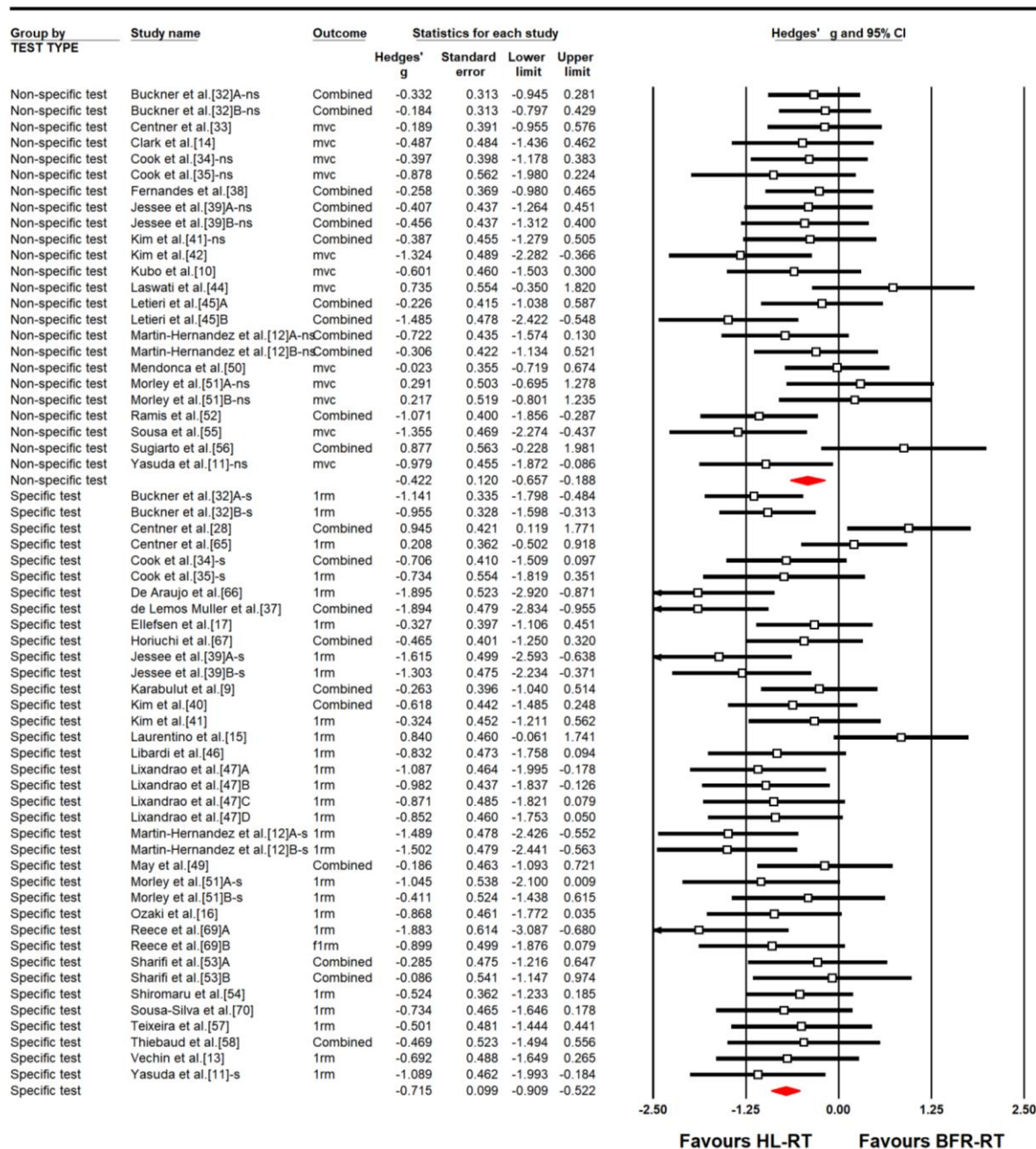


Fig. S12 Funnel plot of studies comparing muscle strength between high-load resistance training (HL-RT) vs. low-load resistance training combined with blood-flow restriction (BFR-RT). The diamond represents the Hedges' g overall standard error.

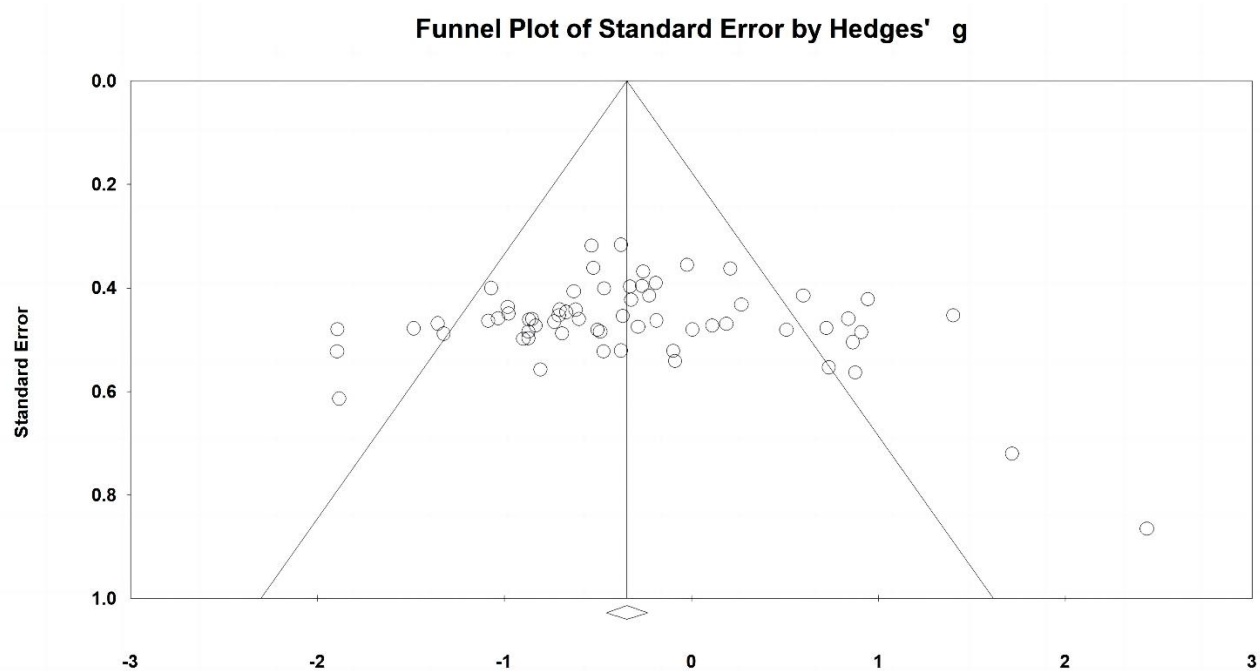


Fig. S13 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle hypertrophy according to age in the untrained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *csa* cross-section area, *HL-RT* high-load resistance training, *mt* muscle thickness.

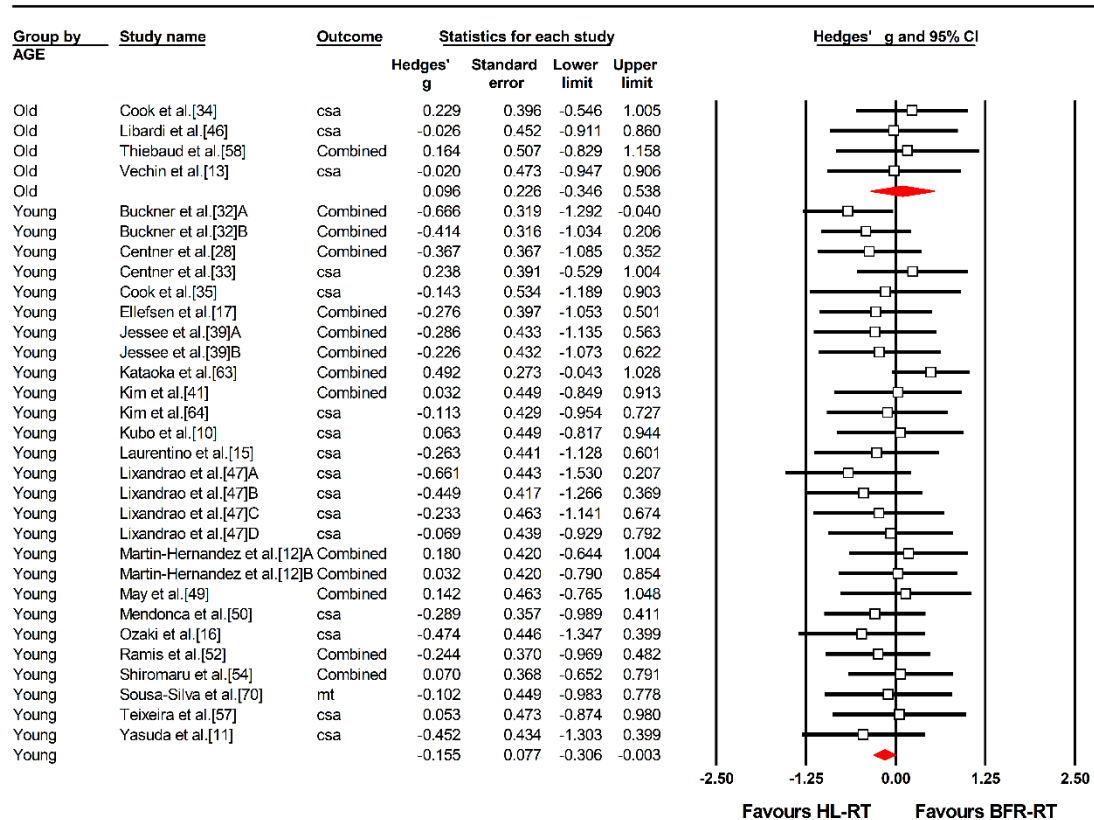


Fig. S14 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle hypertrophy according to limbs in the untrained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *csa* cross-section area, *HL-RT* high-load resistance training, *mas* muscle mass, *mt* muscle thickness.

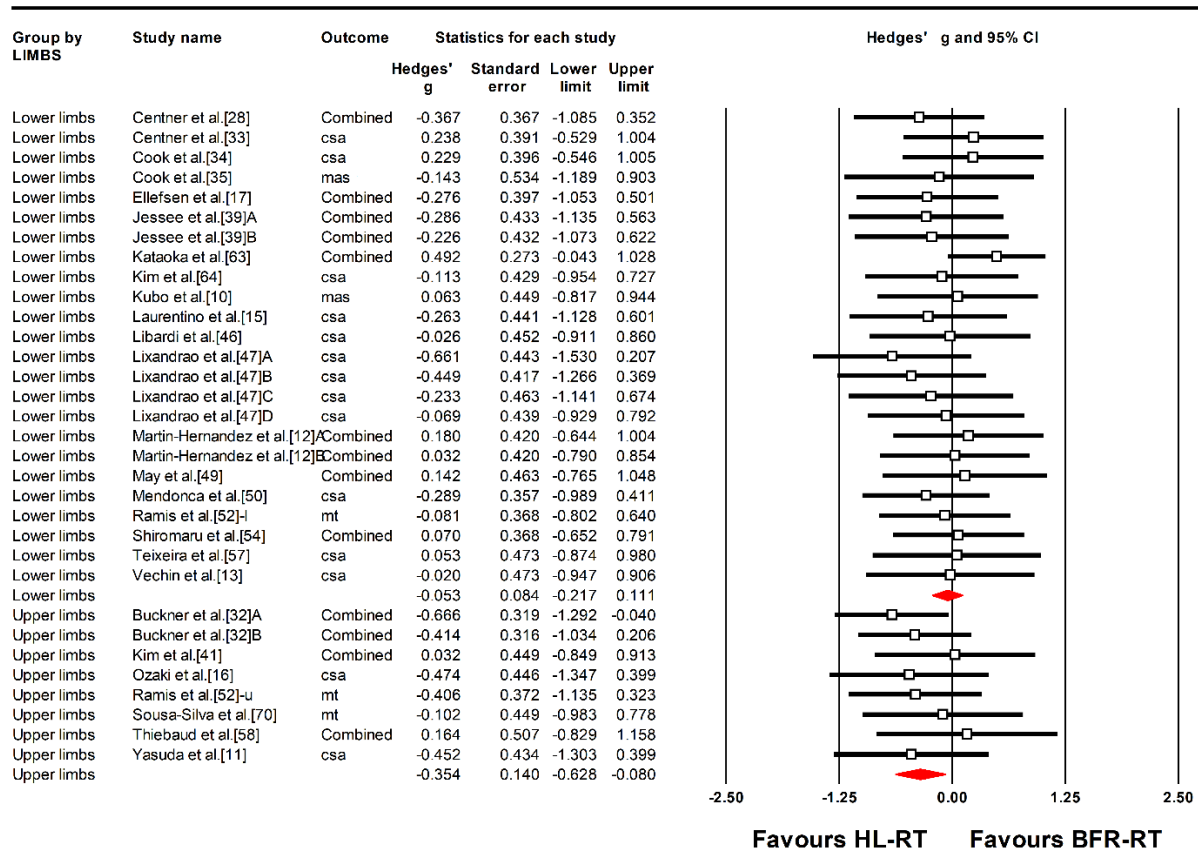


Fig. S15 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle hypertrophy according to training duration in the untrained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *csa* cross-section area, *HL-RT* high-load resistance training, *mt* muscle thickness.

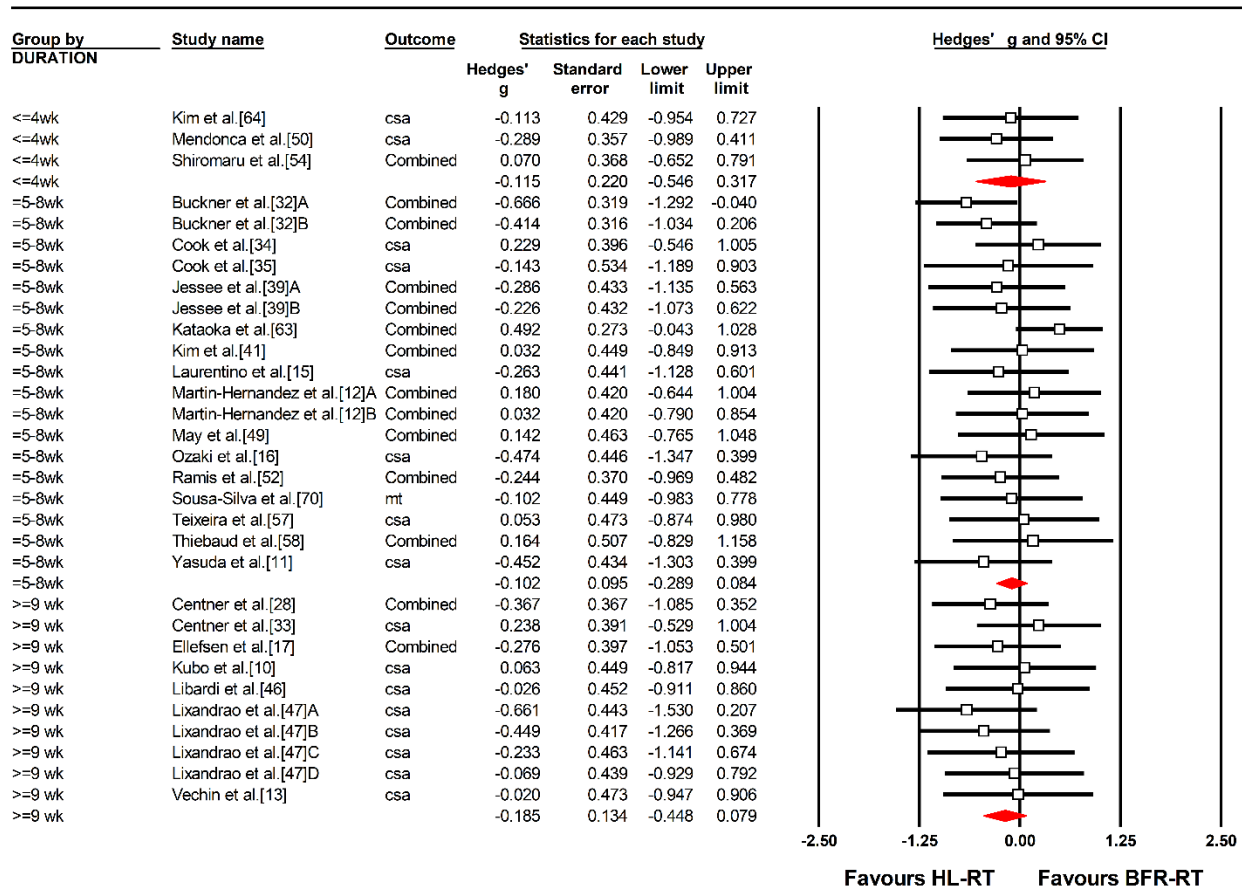


Fig. S16 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle hypertrophy according to training frequency in the untrained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *csa* cross-section area, *HL-RT* high-load resistance training, *mt* muscle thickness.

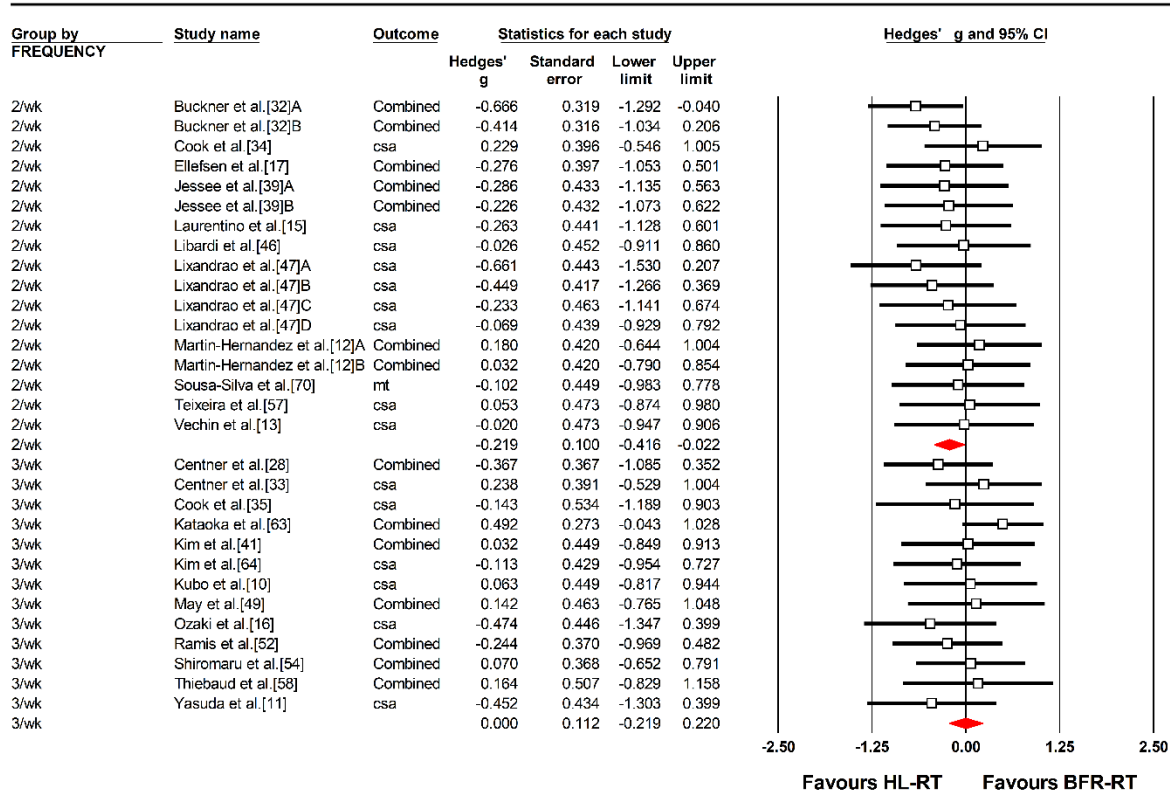


Fig. S17 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle hypertrophy according to lower limb region specificity in the untrained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *csa* cross-section area, *HL-RT* high-load resistance training, *-d* distal femur, *-m* middle femur, *-p* proximal femur.

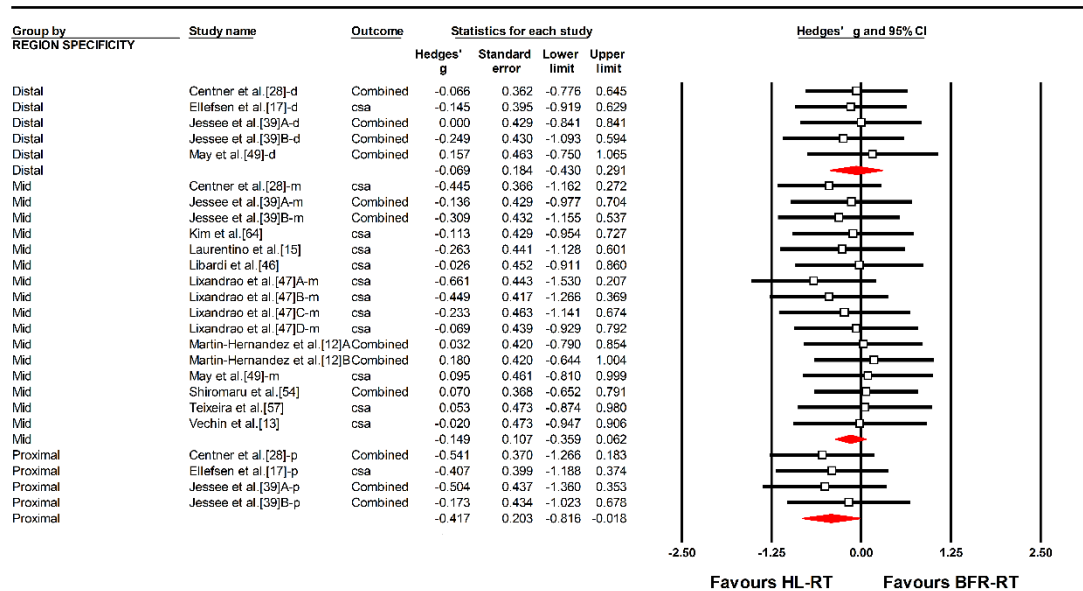


Fig. S18 Forest plot of the effect size difference between BFR-RT versus HL-RT for muscle hypertrophy according to upper limb region specificity in the untrained individuals. Different capital letters are used to represent different training protocols for the same study. Hedges'g represents effect size difference. Red diamonds represent overall Hedges'g of subgroups. *BFR-RT* blood-flow restriction low-load resistance training, *CI* confidence interval, *Combined* mean of multiple outcomes from the same training protocol, *csa* cross-section area, *HL-RT* high-load resistance training, *mt* muscle thickness, *-m* middle humerus, *-p* proximal humerus.

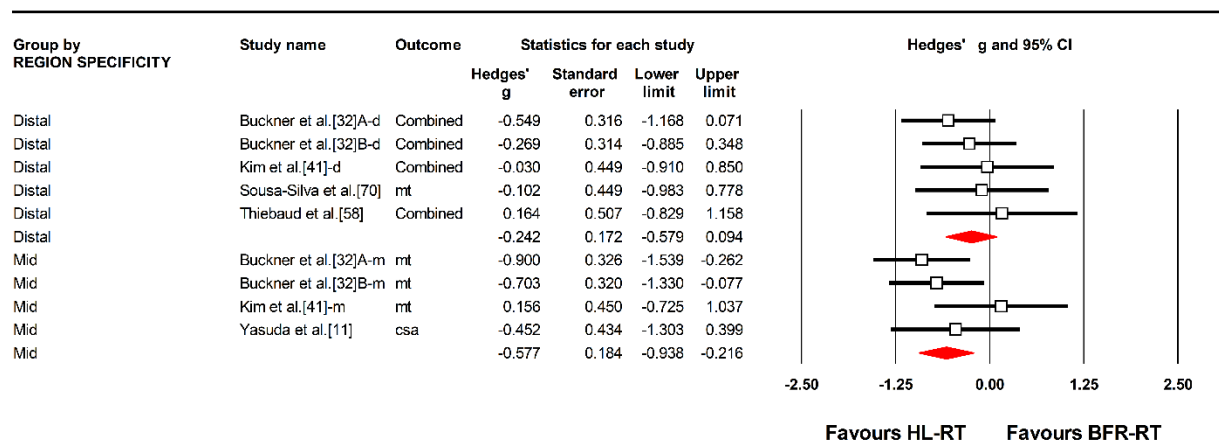


Fig. S19 Funnel plot of studies comparing muscle hypertrophy between high-load resistance training (HL-RT) vs. low-load resistance training combined with blood-flow restriction (BFR-RT). The diamond represents the Hedges' g overall standard error.

Funnel Plot of Standard Error by Hedges' g

