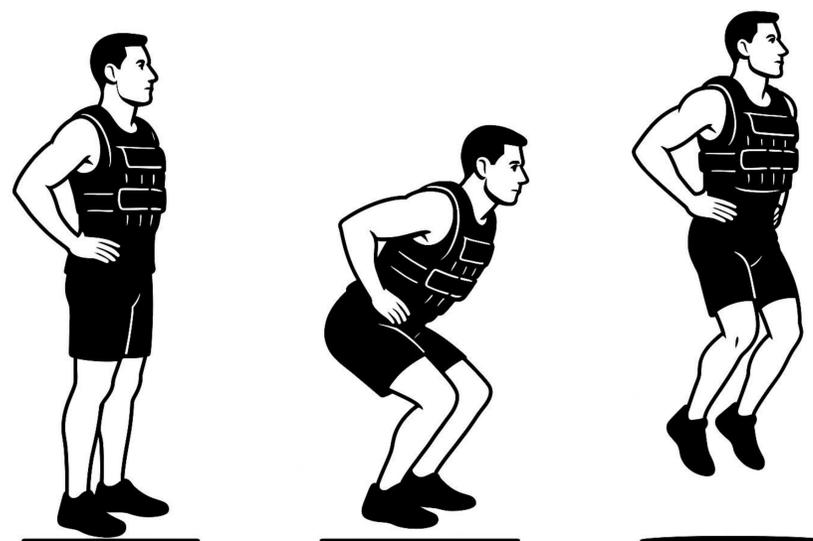


### Purpose

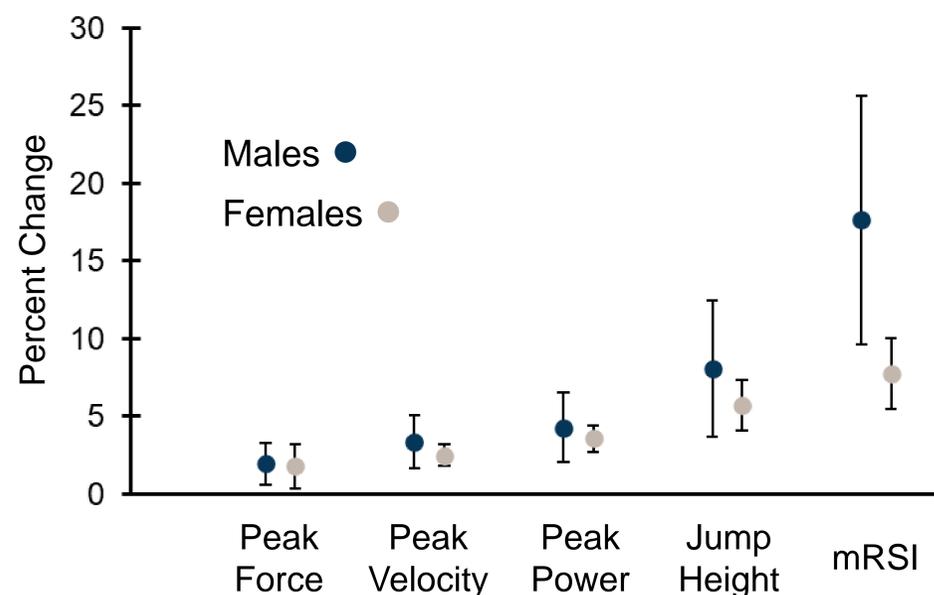
- Examine post-activation performance enhancement (PAPE) effect (i.e. short-term aftereffects) of a weighted vest on countermovement jump (CMJ) performance among males and females

### Methods

- **Subjects:** 15 males (age: 23.9 ± 2.2 years) and 14 females (age: 22.6 ± 1.2 years)
- Participants had a history of sports participation, regularly engaged in exercise, and reported no history of significant lower body injury or surgery
- CMJs on a force platform in 3 conditions (in order):
  - 1) Baseline – no additional load
  - 2) Weighted – weighted vest (Figure 1)
  - 3) Post – weighted vest removed
- Weighted vest included additional load of 10% body mass (range: 9.2-10.9%)
- Rest periods between trials and conditions (30 s between trials, 60 s between conditions)
- **Variables:** peak force, peak velocity, peak power, jump height, and the modified reactive strength index (mRSI)
- **Statistical analysis:** mixed-model ANOVA, with a between-subjects factor of “sex” (male, female) and a within-subjects factor of “condition” (baseline, weighted, post); post-hoc tests for pairwise comparisons (alpha level = 0.05)
- Pairwise comparisons conducted separately for males and females when there was a significant sex-by-condition interaction effect
- Mean percent change (%Δ) calculated to quantify magnitude of changes; positive values reflect an increase from baseline to post



**Figure 1.** Illustration of a subject performing a CMJ while wearing weighted vest (10% body mass); CMJ phases: standing (left), countermovement (center), flight (right)



**Figure 2.** Mean percent change for males (●) and females (●) (post vs. baseline); ± standard error

### Results

- Sex-by-condition interaction effects for peak power (p=0.01), jump height (p=0.04), and mRSI (p=0.02); main effects of condition for peak force (p<0.001) and peak velocity (p<0.001)
- Males exhibited increased peak power (p=0.01; %Δ = 4.3%), jump height (p=0.02, %Δ = 8.1%), and mRSI values (p=0.001, %Δ = 17.6%) in the post condition (vs. baseline); females did not exhibit significant changes for these variables (p≥0.12) (Figure 2)
- Overall, subjects exhibited greater peak velocities (p=0.01, %Δ = 3.0%) in the post condition (vs. baseline); peak force did not differ significantly from baseline to post (p=0.06, %Δ = 1.9%) (Figure 2)

### Conclusions

- For males, performing CMJs with a weighted vest (10% body mass load) acutely enhanced lower body power, jump height, and reactive strength
- This response was not observed in our female sample and may be due to lower absolute and relative strength in the female participants, which is a factor previously shown to moderate PAPE

### Practical Applications

- For males, performing CMJs with a weighted vest appears to be an effective priming strategy to enhance neuromuscular performance
- Effects can be elicited with relatively light loads of 10% body mass, and short rest periods (~1-minute)
- PAPE response appears to be less pronounced among females, potentially due to sex differences in lower body strength

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