

Comparison of Acute Cardiometabolic Responses in a 7-Minute Body Weight Circuit to a 7-Minute HIIT Cycle Protocol

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ABSTRACT

Many smartphone applications available promote exercise engagement, specifically in short bouts of time. One such application “The 7-minute workout challenge” promotes a brief exercise bout, however details on the potential cardiometabolic health benefit is lacking. **Purpose:** To investigate the acute cardiometabolic responses of a 7-minute body-weight resistance exercise circuit (HICE) compared to a 7-minute high intensity interval training cycle protocol (HIIE). **Methods:** Apparently healthy and active young adults (N=12, 50% Female, 24.0±3.4 yr, BMI: 28.1±6.4 kg/m²) were enrolled in a randomized crossover study (HICE vs HIIE). The 12 HICE exercises were 30 seconds each using a standardized cadence, followed by a five-second transition period between followed by a three-minute cool-down and was replicated in the HIIE protocol. The HIIE protocol used cycling at 70 RPM at predetermined power output that elicited a heart rate response of 70-80% of HR max using a similar 30:5 second exercise to rest ratio. Following each protocol, subjects were seated for the next hour. Measurements included blood pressure (BP) and heart rate, taken prior to exercise, immediately after, 15, 30, 45, and 60-minutes post-exercise, and blood glucose and blood triglycerides taken only prior to exercise, immediately after and at 60-minutes. General mixed linear modeling was used to analyze the data ($p \leq 0.05$) and Cohen’s d was calculated for effect size. *Post hoc* analysis of individual time points used Bonferroni adjustment. **Results:** There was no significant difference in overall systolic BP between HIIE and HICE ($\beta = 1.639$ mmHg, $p = 0.168$, $d = 0.213$). However, there was a significant difference in overall diastolic BP resulting a higher response in HIIE ($\beta = 2.273$ mmHg, $p = 0.002$, $d = 0.436$). Immediately after exercise ($\beta = 5.018$ mmHg, $p = 0.001$, $d = 0.962$) and at 15 minutes ($\beta = 3.945$ mmHg, $p = 0.018$, $d = 0.756$) exhibited significant and trending, respectfully, higher values in diastolic BP for HIIE. The overall post-exercise heart rate was lower for HIIE vs HICE ($\beta = -8.955$ bpm, $p < 0.001$, $d = -0.857$). Furthermore, all individual time points ($\beta = -5.737$ to -11.791 bpm, $p < 0.001$, $d \geq 0.549$) except for 45-min post-exercise HR were significantly lower in HIIE vs HICE. Blood glucose had no overall difference between the two protocols ($\beta = -0.200$ mmol/L, $p = 0.104$, $d = 0.480$). Triglycerides had no overall difference on HIIE vs HICE ($\beta = 0.014$ mmol/L, $p = 0.966$, $d = 0.007$). **Conclusion:** The HICE protocol had a similar cardiometabolic response post-exercise to HIIE, but did have a reduction in diastolic BP post-exercise. However, post-exercise heart rate was higher. Future research should investigate the potential blood pressure benefit of using such an application utilizing body-weight resistance exercises for multiple time points across a single day or multiple days.