A Comparison of High-Intensity Interval Running and TABATA on Post-Exercise Metabolism: A Pilot Analysis

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ABSTRACT

It is unclear how post-exercise metabolism would compare following the completion of 2 different modes of high-intensity exercise. **PURPOSE:** Compare the effects of high-intensity interval running (HIIR) and Tabata when performed at a similar duration and intensity. **METHODS**: Recreationally active individuals (n = 7; 6F, 1M; age = 22.2 ± 2.1 yrs; body mass = 64.2 ± 12.0 kg; body fat% = 26.2±3.1) completed 1) a rest bout, 2) a Tabata bout using only body callisthenic exercises, and 3) a bout of high-intensity interval running (HIIR) on a motorized treadmill. Participants performed each of the 3 bouts on separate days with at least 7 days in between bouts. Prior to beginning the study, participants completed a running test on a treadmill to determine their maximal heart rate. Participants were also familiarized to both Tabata and HIIR prior to beginning the study. The Tabata protocol was performed before the HIIR protocol because these two protocols were set up to be performed at the same heart rate (HR). Therefore, the order of this study was randomly assigned in sequence as Tabta→HIIR→Rest, Tabata→Rest→HIIR, or Rest→Tabata→HIIR. Rest consisted of sitting quietly. Tabata was performed for 25 minutes and involved performing repeated cycles of total body calisthenics at maximal effort for 20 seconds followed with 10 seconds of rest. HIIR involved repeated cycles of running at the same average HR as the Tabata for 1 minute followed with 1 minute of walking at a self-selected pace for 25 minutes. Following the completion of each bout, the participants' metabolic rate (MR) was assessed in 10 minute intervals over the next 70 minutes. The MR assessment included calculating the participants' average VO_2 (l/min), respiratory exchange ratio (RER), fat oxidation (total grams), and total energy expenditure (TEE). Significant differences ($p<.05$) between the bouts were determined using a one-way, repeated measures ANOVA and Bonferroni post-hoc test. **RESULTS:** Average HR (bpm) during Tabata (174.3±5.4) was significantly higher ($p=.027$, ES=1.1) compared to HIIR (165.7±9.9). Average VO_2 was significantly higher following both the HIIR (.28±.04, $p=.026$, ES=.75) and Tabata (.30±.06, $p=.007$, ES=.98) compared to rest (.25±.04) with no differences between the exercises ($p=.07$, ES=.59). TEE was significantly higher following both the HIIR (96.7±14.0 kcal, $p=.026$, ES=.64) and Tabata (104.1±20.3 kcal, $p=.008$, ES=.94) compared to rest (87.9±13.6 kcal) with no differences between the exercises ($p=.07$, ES=.42). The RER was significantly lower following the HIIR (.76±.03, $p=.002$, ES=1.8) compared to rest (.83±.04). The RER was significantly lower following Tabata (.75±.02, ES=2.5) compared to rest. The RER was not different between the exercises ($p=.39$; ES=.34). The fat oxidation was significantly higher following both the HIIR (7.8±1.9, $p=.001$; ES=1.3) and Tabata (8.8±1.8, $p=.001$; ES=1.9) compared to rest (5.1±2.1) with no differences between the exercises ($p=.13$; ES=.54). C**ONCLUSION:** Despite the significant differences in heart rate between HIIR and Tabata both exercise bouts elicited similar changes in post-exercise metabolism when compared to rest. Both HIIR and Tabata might be lifestyle practices that promote healthy weight management, however the small sample size and short metabolic assessment period limits the application of our results. A larger sample size and an expanded assessment period could better clarify the effectiveness of these exercises.