

## The Influence of Different Modes of TABATA on Post-Exercise Metabolic Recovery

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### ABSTRACT

**PURPOSE:** Evaluate post-exercise metabolic recovery of individuals who perform Tabata as 1) full body calisthenics (FB) and 2) treadmill running (TR) and compare those responses to when no exercise is performed (rest). **METHODS:** Recreationally active men (M) (n=9) and women (W) (n=16) performed each of 3 bouts on separate days with at least 7 days in between each bout. Rest consisted of sitting quietly for 25 minutes. FB was performing 25 minutes of repeated cycles of body calisthenics at vigorous effort for 20 seconds followed with 10 seconds of rest. TR involved 25 minutes of repeated sprints on a treadmill for 20 seconds followed with 10 seconds of rest. The individuals performed both the FB and TR trials at approximately 85% of their maximal heart rate (85%HRmax). Immediately following the completion of each bout, the participants' metabolic rate (MR) was assessed in 10-minute intervals over the next hour using a Parvo metabolic analyzer. The MR assessment included the participants' estimated energy expenditure (EE), respiratory exchange ratio (RER), fat oxidation (total grams), and carbohydrate (CHO) oxidation (total grams). Significant differences ( $p < .05$ ) between the bouts were determined using a one-way, repeated measures ANOVA and Bonferroni post-hoc test. **RESULTS:** For M, average HR (bpm) during FB ( $173.7 \pm 6.4$ ) was similar ( $p = .97$ ) to the average HR during TR ( $173.6 \pm 10.3$ ). For W, average HR (bpm) during FB ( $172.8 \pm 7.9$ ) was similar ( $p = .53$ ) to the average HR during TR ( $174.1 \pm 9.1$ ). For W, EE was unchanged between bouts ( $p = .16$ ). For M, EE following FB ( $87 \pm 12.7$  kcal) was significantly higher ( $p = .0004$ ) compared to rest ( $69.3 \pm 9.8$  kcal) with no other reported differences in EE between bouts. RER was significantly reduced following FB in M ( $.78 \pm .05$ ;  $p = .0002$ ) and W ( $.79 \pm .08$ ;  $p = .001$ ) when compared to rest ( $M = .87 \pm .06$ ;  $W = .88 \pm .08$ ). In addition, RER was significantly lower following FB compared TR in men ( $.78 \pm .05$  vs  $.83 \pm .08$ ;  $p = .004$ ) and women ( $.79 \pm .08$  vs  $.84 \pm .08$ ;  $p = .0004$ ). RER was lower following TR in both men and women (compared to rest) but these reductions were non-significant ( $p > .05$ ). In men, fat oxidation was significantly increased following both FB ( $7.1 \pm 1.8$ ;  $p = .0002$ ) and TR ( $5.2 \pm 2.3$ ;  $p = .02$ ) compared to rest ( $3.5 \pm 1.5$ ). In women, fat oxidation was significantly increased following both FB ( $4.8 \pm 2.0$ ;  $p = .0002$ ) and TR ( $3.9 \pm 1.8$ ;  $p = .007$ ) compared to rest ( $2.7 \pm 1.3$ ). In addition, fat oxidation was significantly greater following FB compared to TR in men ( $p = .001$ ) and women ( $p = .0001$ ). CHO oxidation was reduced following FB in men ( $5.8 \pm 3.6$ ) and women ( $4.5 \pm 4.4$ ) compared to rest ( $M = 9.6 \pm 4.2$ ;  $W = 7.9 \pm 3.1$ ) but these reductions were non-significant ( $p > .05$ ). CHO oxidation following FB was lower compared to TR in men ( $8.8 \pm 5.5$ ) and women ( $7.0 \pm 4.4$ ) but was non-significant ( $p > .05$ ). CHO oxidation was unchanged between rest and TR. **CONCLUSION:** Men and women experienced elevations in fat oxidation while recovering from a single bout of Tabata performed as FB or TR with fat oxidation being higher following FB when compared to TR. Higher use of fat following FB might be due to 1) more muscle use during FB and 2) the vigorous effort of Tabata both resulting in more CHO use during exercise thus increasing the body's reliance on fat during recovery to help replenish glycogen stores. Future studies should examine responses to a multi-week Tabata training regimen, as well as, examine post-exercise responses for periods in excess of one hour in order to determine if Tabata training has any chronic influence on the metabolic recovery of most individuals.