

Effects of Different Intensity and Duration of Warm-Up on Hemodynamics, Jump Power, and Flexibility

IMTIAZ MASFIQUE DOWLLAH, EZRA MEZA, AMANDA HANKINS, ORLANDO CEPEDA, KLARISSA YBARRA, BRENDA PALMA, BRIANNA LOPEZ, MANUEL NUNEZ, ALEXANDRIA HINOJOSA, ULKU KARABULUT, & MURAT KARABULUT
FACSM

Neuromuscular Performance Laboratory; Department of Health and Human Performance; University of Texas Rio Grande Valley; Brownsville, TX

Category: Masters

Advisor / Mentor: Karabulut, Murat (murat.karabulut@utrgv.edu)

ABSTRACT

Tabata protocol (TP), usually consisting of eight to nine bouts of 20-sec of maximal exercise with 10-sec rest, is time-efficient intervention with both aerobic and anaerobic benefits. **PURPOSE:** This study investigated the effectiveness of different variation of TP as a warm-up procedure. **METHODS:** Twenty-five healthy subjects (13 females and 12 males) participated in this study. Participants performed 6 randomized exercise sessions separated by at least 48 hours. The exercise sessions involved 3-min (TP3-20:10; TP3-30:10), 5-min (TP5-20:10; TP5-30:10) or 8-min (TP8-20:10; TP8-30:10) consecutive bodyweight squats of either 20-sec workout with 10-sec rest (20:10) or 30-sec workout with 10-sec rest (30:10). Heart rate (HR), blood pressure (BP), thigh skin surface temperature (TT), vertical jump performance (VJ), and flexibility (F) were measured before and after execution of the protocols. Countermovement jump was used to measure VJ and sit-and-reach test was used for measuring F. **RESULTS** Two-way ANOVA demonstrated significant condition*time interaction ($p < 0.01$) and time main effect ($p < 0.01$) for F. Significant condition*time interaction ($p < 0.01$) and condition ($p < 0.01$) and time main effects ($p < 0.01$) were observed for HR. There were significant main effects for time with the post-test demonstrating higher values than the pre-test values for both SBP and DBP ($p < 0.01$). Significant time main effect ($p < 0.01$) was also noted for TT indicating reduction in TT following exercise bouts. **CONCLUSION:** The findings are suggestive of a decrease in F following a higher duration of exercise (TP8-20:10 and TP8-30:10). This may be ascribed to greater accumulation of metabolites (lactic acid, ammonia and hydrogen ion) in the working muscles, which may alter Type III and IV afferent neural activity to increase pain perception. Local tissue acidosis also stimulates bradykinin release, which may contribute to the transmission of nociceptive signals from skeletal muscle. Additionally, a higher duration of exercise may increase cortisol level that decreases the pain threshold level. Therefore, the decreases in flexibility may be explained by one or combination of metabolic, hormonal, and neurobiological changes stimulating the brain to inhibit the muscular response.