

ETHAN VARGO-THOMAS, SHAWN REESE, & DEREK DEWIG, Health and Human Performance Dept, Fairmont State University, Fairmont, WV, 26554. The effects of fatigue on reaction time and landing force during a jumping task.

Fatigue may influence injury risk in athletes through alterations biomechanics, neuromuscular control, and reaction time (RT). The objective of this study was to examine the influence of fatigue on lower body RT and landing forces. During this crossover study, fourteen healthy participants completed three RT tasks before and after a fatigue and control intervention. For all tasks, a computer monitor was placed in front of two side-by-side forceplates and randomly displayed a “left” or “right” facing arrow. The participants were instructed to jump to the forceplate that corresponded to the arrow as quickly as possible. Participants completed six single-leg tasks for the right and left leg, separately, and six double-leg tasks where the landing leg corresponded to the displayed arrow. The fatigue condition consisted of continuous vertical jumps until jump height failed to reach 80% of participant’s maximum jump height for three consecutive jumps. The control session consisted of a five-minute seated rest. Interventions were counterbalanced and separated by a one-week washout period. RT was the difference in time between the arrow index and onset of vertical force signal (>20N). Peak vertical force was normalized to body weight. Separate, mixed-effects linear models were conducted utilizing post-test values, with condition and pre-test values as fixed factors and subject as a random factor. Peak landing force was significantly greater post-fatigue (1.92 xBW) compared to post-control (1.58 xBW) only during the double-leg task ($P = 0.024$). This finding suggests that fatigue influences landing forces, which may heighten the risk of lower extremity injury.

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