

Lower Extremity Proprioception and Physical Performance Testing: A Correlation Study

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ABSTRACT

Proprioception is a function of the somatosensory system which has implications for activities of daily living, athletic endeavors, and risk of injury. It has been suggested that athletes who sustain injuries may have decreased proprioception and a corresponding increase in the risk of re-injury. Interventions for injury prevention and/or recovery may include, but are not limited to, emphasis on proprioceptive ability via joint position awareness. The purpose of this investigation was to determine if a correlation exists between proprioceptive ability and other components of physical performance such as lower body muscular power and change of direction. It was hypothesized that significant correlations would exist. Participants included 7 males and 2 females (age 15 ± 2 yrs., height $1.51 \pm .15$ m, mass 68.2 ± 17.14 kg) who did not have a lower extremity injury or surgery within 6 months of this investigation. Proprioceptive testing included the Stork Standing test (SST) and ankle Joint Position Sense (JPS). Lower extremity proprioceptive testing was performed unilaterally in both eyes closed and open conditions. Lower body muscular power and change of direction were assessed via the vertical jump (VJ), one step vertical jump (1VJ), standing long jump (SLJ), 9.14 m (10-yard) dash, and pro agility (PA). Associations were determined via a Pearson Product Moment Correlation and the criterion alpha was set *a priori* at $p \leq 0.05$. Significant correlations were observed between SST with eyes closed on the non-dominant leg and both VJ ($r = -0.82$) and 1VJ ($r = -0.82$). In addition, a significant correlation was observed between SST with eyes closed on the dominant leg and the 9.14 m dash ($r = -0.90$). The results of our investigation suggest a link between proprioception and lower body muscular power. Additional investigations should examine the causal relationships between these variables to attempt to determine the efficacy of interventions designed to improve one or more of the aforementioned characteristics as well as any potential influence on injury risk.