

The Relationship Between Handgrip Fatigue and Performance Scores in NCAA Division I Women's Artistic Gymnasts

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ABSTRACT

Maximal isometric handgrip strength (HGS) is used as an indicator of overall muscular strength and has also been found to be predictive of certain athletic events sporting prowess. We recently found that HGS was not related to performance scores in female collegiate gymnasts. However, handgrip fatigue (HGF) has previously been found to strongly relate to HGS in male gymnasts, but has never been examined in relation to performance scores (from 0 to 10 as perfect) in any gymnasts, male or female. **PURPOSE:** Examine the relationship between HGF and performance scores for the 4 events of vault, uneven bars, beam, and floor in female collegiate gymnasts. **METHODS:** Twenty-five (n=25) female National Collegiate Athletic Association (NCAA) Division I women's artistic gymnasts (age: 20.1±1.3 yrs; height: 158.9±5.6 cm; mass: 58.2±5.3 kg) were assessed for absolute HGF in kg and relative HGF (HGF/height in m²), as well as their average vault, uneven bars, beam, and floor performance scores across a competitive season. For the HGF measurement, subjects maximal absolute HGS was determined first. Then, subjects held 50% of their absolute HGS until failure. Then, within 10 sec. a second maximal HGS measurement was taken as the absolute HGF value. Pearson correlation coefficients (r) were determined between HGF measurements and all performance scores. **RESULTS:** The performance scores were: average vault (9.72±0.01), uneven bars (9.75±0.05), beam (9.58±0.19), and floor (9.47±0.43). Absolute HGF (21.8±3.1 kg) was significantly (p<0.001) strongly correlated (r= 0.62) with absolute HGS (30.8±4.4 kg). No significant (p>0.05) correlations were found between absolute HGF or relative HGF (8.5±1.3 kg) and any 4 gymnastics event's performance scores (r range: -0.59-0.36 or r range: -0.46-0.17, respectively). **CONCLUSIONS:** In the current population of gymnasts, HGF was strongly related to HGS, but absolute HGF or relative HGF were not related to any gymnastics events performance scores. Findings from this study can be used by athletes, coaches, and practitioners in the collegiate women's gymnastics realm.