

Sex Differences in the Flexibility and Strength of Recreational Golfers

Windley TC, Fradkin AJ, Myers JB, Sell TC, Tsai Y-S, Lephart SM

Department of Sports Medicine and Nutrition, University of Pittsburgh, Pittsburgh, PA, USA.

Purpose/Hypothesis: Male and female golfers tend to differ in both injury patterns and certain golf performance measures like driving distance, with these differences possibly associated with levels of conditioning. The purpose of this study was to examine sex differences in lead (left for a right handed golfer) and trail (right for a right handed golfer) side shoulder, torso, and hip flexibility and strength in a matched sample of male and female recreational golfers between the ages of 30 and 49 years. We hypothesized that females would demonstrate greater shoulder, hip, torso, and hamstrings flexibility than males, and that males would demonstrate greater shoulder, torso, and hip strength than females.

Number of Subjects: 20 male (42.0 ± 5.8 yrs; 177.3 ± 6.8 cm; 83.4 ± 8.3 kg) and 20 female (42.1 ± 5.2 yrs; 169.8 ± 8.1 cm; 65.7 ± 9.9 kg) healthy, recreational golfers between the ages of 30 and 49 were matched for golf handicap (± 5 pts) and age (± 5 yrs).

Materials/Methods: A Biodex System III dynamometer was used to measure torso rotation flexibility, reciprocal concentric isokinetic torso rotation strength ($120^\circ/\text{sec}$) and shoulder internal/external rotation strength ($60^\circ/\text{sec}$), and isometric hip abduction/adduction strength at 0° hip abduction. Strength was measured as the average peak torque normalized by body weight (%BW). Shoulder internal/external rotation, flexion/extension, hip flexion/extension, and hamstrings flexibility were measured with a standard goniometer and averaged over three trials. Six separate MANOVAs with Bonferroni alpha corrections were used to examine sex differences in shoulder, torso and hip/hamstrings flexibility and shoulder, torso, and hip strength.

Results: Females exhibited greater bilateral flexibility than males for shoulder internal/external rotation, torso rotation, hip flexion, and hamstrings ($p \leq 0.05$). Females also demonstrated significantly greater lead side shoulder extension and trail side hip extension ($p \leq 0.05$). Males exhibited significantly greater bilateral shoulder internal/external rotation and torso rotation strength than females ($p \leq 0.05$).

Conclusions: In general, female golfers were more flexible in the majority of measured areas than male golfers in this study. Male golfers were stronger bilaterally than female golfers in the shoulders and torso but not hips.

Clinical Relevance: Male and female golfers demonstrated different flexibility and strength profiles that may lead to the varied golf performance levels and injury patterns seen across sex in golfers. Clinical interventions designed to rehabilitate injured golfers, prevent golf injuries, or improve golf performance should take these differences into account.

Key Words: golf, strength, flexibility.