Shoulder Strength Profiles in Those With and Without Scapular Dyskinesis
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Context: Muscular weakness of the shoulder has been demonstrated in individuals with scapular dyskinesis (SD). The majority of studies have focused on symptomatic patients; however, little is known regarding muscular performance in healthy individuals with SD. Objective: Our objective was to compare strength measures of the shoulder complex between healthy individuals with and without SD. We hypothesized that strength differences would exist between the groups. Design: Descriptive laboratory study. Setting: Biomechanics laboratory. Patients or Other Participants: Forty healthy, college-aged participants (22.20 ± 2.37 years; 169.85 ± 8.70 cm; 68.74 ± 12.98 kg; 23.68 ± 3.09 kg/m²; 12 males, 28 females) without any history of dominant shoulder pathology were recruited. We elected to conduct a matched-pairs analysis due to disparity in the number of individuals that presented with SD versus those without SD. Participants were matched based on sex and BMI resulting in 13 matched-pairs (22.00 ± 2.06 years; 168.77 ± 8.07 cm; 70.98 ± 13.14 kg; 24.75 ± 3.04 kg/m²; 6 males, 20 females).

Interventions: Participants completed the PAR-Q and the ASES Standardized Shoulder Assessment to confirm general health fitness and a healthy shoulder status. The presence of SD was determined using the scapular dyskinesis test. We utilized a dichotomous method (yes/no) to categorize those with and without SD. Strength of the scapula stabilizers and rotator cuff was assessed via manual muscle testing using a handheld dynamometer (ICC₁₂ = .92–.97) for the upper trapezius (two methods: UT1 and UT2), middle trapezius (MT), lower trapezius (LT), serratus anterior (SA), supraspinatus (SS), and the medial (MR) and lateral (LR) rotators. Main Outcome Measures: For each manual muscle test, mean peak force (kg) of three trials were normalized to body mass (kg) and used for data analysis. Additionally, strength ratios (UT/LT, UT/MT, LT/MT, SA/UT, SA/MT, SA/LT, and LR/MR) were calculated and analyzed. Differences in strength and strength ratios between those with and without SD were compared using separate two-way mixed ANOVAs with repeated measures with an alpha level of .05. Results: A majority (68%) of subjects were found to have SD. No significant differences or interactions were observed for strength between SD groups (F₁,₈₃,₄₃.₉₂ = 1.10, P = .34) or strength ratios and SD groups (F₁,₈₃,₄₄.₀₂ = 1.93, P = .16). A significant main effect (F₁,₈₃,₄₃.₉₂ = 239.32, P < .001) was revealed for strength indicating differences between several of the muscles tested across both groups. Post-hoc analysis revealed trends that resulted in a generalized order of the muscles from strongest to weakest: UT, followed by SA and MT, LT, SS, MR, and LR. Conclusions: Our results indicate that differences in shoulder muscle strength do not exist in healthy subjects with and without SD. Additionally, SD appears to be commonly found in healthy populations. Word Count: 450