

Introduction

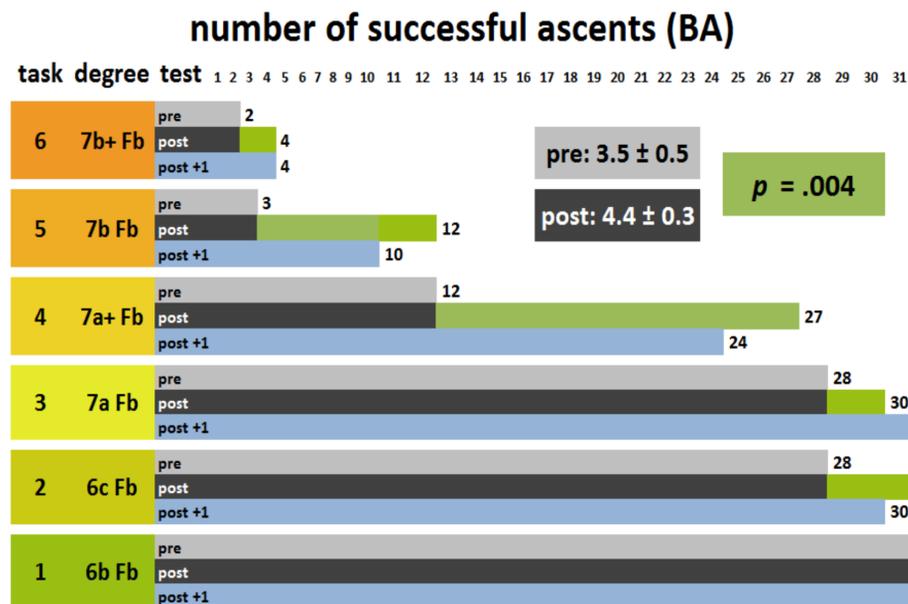
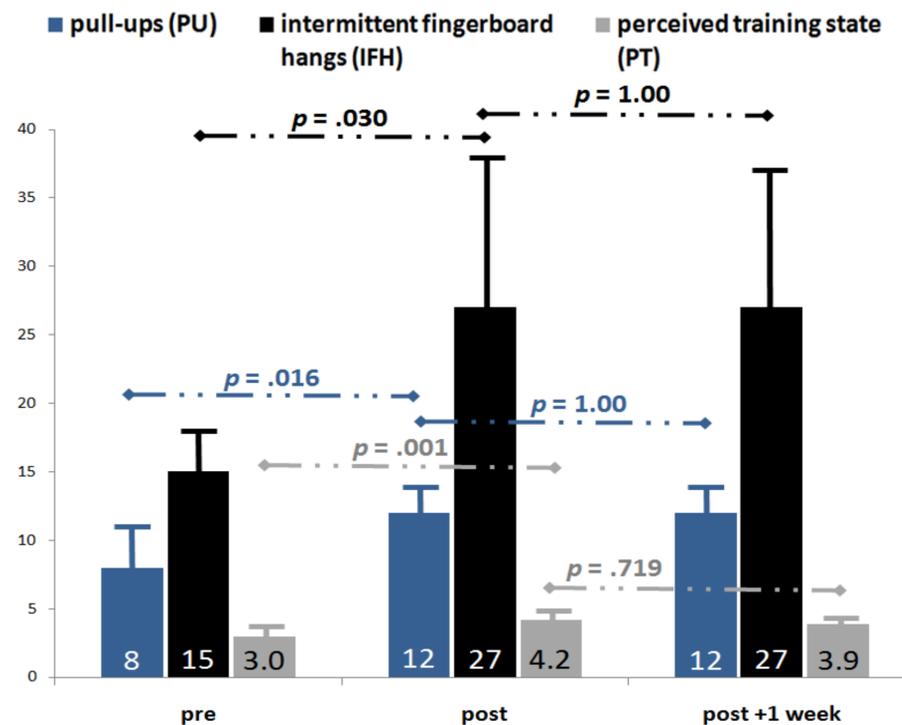
System boards are compact bouldering walls outfitted with climbing holds that are set in a symmetrical pattern to guarantee a simultaneous workout of both body sides. The purpose of the present study was to investigate the use of a 60-degree-overhanging, 3.5-metre-high, and 2.5-metre-wide system board (T-Wall) to increase (a) the bouldering ability level, (b) the sport-specific finger and (c) upper body strength, and (d) local muscular resistance.

Methods

Thirty-one male experienced athletes (29.9 ± 5 yrs; 1.73 ± 0.8 m; 64.7 ± 5 kg; 7.7 ± 4 yrs bouldering experience; 7a Fontainebleau ability level) participated in a 4-week system board regimen (three sessions per week, each of a 120 min duration), using the ticklist-method, in which participants attempted in each session a maximum of 12 bouldering tasks. Data collection (pre-test, post-test after 48 hrs, and post-test after one week) included the number of successful bouldering ascents (BA), handheld grip strength dynamometry (GS), the total number of pull-ups (PU), lactic acid analysis (LAC) post-intermittent fingerboard hangs to exhaustion (IFH), body weight (BW), self-perceived activation (PA) and training state (PT), room temperature (T), and humidity (H). All subjects provided written informed consent and the study protocol received ethical approval from the German Sport University.

Results

MANCOVA indicated significant effects in PU (pre: 8 ± 3 ; post: 12 ± 2 , $p = .016$; post+1: 12 ± 2 , $p = 1.00$) and IFH (pre: 15 ± 3 ; post: 27 ± 11 , $p = .030$; post+1: 27 ± 10 ; $p = 1.00$) with non-significant LAC results (pre: 3.4 ± 1 mmol; post: 4.2 ± 1 mmol, $p = .752$; post+1: 4.0 ± 1 mmol, $p = .996$).



BA (pre: 3.5 ± 0.5 ; post: 4.4 ± 0.3 , $p = .004$; post+1: 4.3 ± 0.3 , $p = .942$) and PT (pre: 3.0 ± 0.6 ; post: 4.2 ± 0.7 , $p = .001$; post+1: 3.9 ± 0.7 , $p = .719$) were significantly higher after the four-week regimen, whereas non-significant gains were found in GS (pre: 449.7 ± 92 N; post: 511.6 ± 49 N, $p = .517$; post+1: 509.5 ± 50 N, $p = 1.00$). BW, T, an H showed non-significant variations during the tests and emphasize standardized test implementation.

Discussion

Our results highlight that small-sized system boards are effective tools for increasing sport-specific upper body strength and local endurance in indoor bouldering. The observed gains in the present study could mainly be related to the steepness of the board and the strenuous bouldering tasks that were worked maximally to the point of muscular failure. Furthermore, the significant increases in BA and PT emphasize the sport-specific functionality of system board regimens. In contrast, the non-significant GS findings could mostly be attributed to the grip types and shapes (predominantly pinch and sloper holds) used in the set-up of the present investigation.

References

Medernach J, Kleinöder H, Lötzerich H (2016). Movement demands of elite female and male athletes in competitive bouldering. *J Phy Edu Sport*: 836-840. Macdonald J, & Callender N (2011). Athletic profile of highly accomplished boulderers. *Wilderness Environ Med* 22(2): 140-143. White D, Olsen P (2010). A time motion analysis of bouldering style competitive rock climbing. *J Strength Cond Res* 24(5): 1356-1360.

Contact

medernach@climbing.science