

# FINGERBOARD IN COMPETITIVE BOULDERING: TRAINING EFFECTS ON GRIP STRENGTH AND ENDURANCE

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## ABSTRACT

Medernach, JPJ, Kleinöder, H, Lötzerich, HHH. Fingerboard in competitive bouldering: Training effects on grip strength and endurance. *J Strength Cond Res* 29(8): 2286–2295, 2015—Bouldering (BL) is an independent discipline of sport climbing, with grip strength and endurance as key factors. Although the sport has grown increasingly popular and competitive, limited research has been conducted on commonly used training methods to maximize BL performance. The purpose of this study was to investigate the training effects of 4 weeks of fingerboarding (FB) on grip strength and endurance in competitive BL. Twenty-three highly advanced male boulderers ( $25.6 \pm 4.4$  y;  $1.78 \pm 0.05$  m;  $70.1 \pm 5.4$  kg;  $6.2 \pm 2.8$  y climbing; 7b+ Fb mean ability) were randomly allocated to a 4-week FB ( $n = 11$ ) or BL ( $n = 12$ ) training regimen. Pretests and posttests (50-min duration) involved (a) handheld dynamometry (GS) to assess grip strength, (b) dead hangs (DH), and (c) intermittent finger hangs (IFH) to assess grip endurance. After the 4-week regimen, GS increased significantly in the FB group ( $2.5 \pm 1.4$  kg,  $p < 0.001$ ) but not in the BL group ( $1.4 \pm 2.8$  kg,  $p = 0.109$ ). The mean increase in DH ranged from 5.4 to 6.7 seconds in the FB group and was significantly ( $p \leq 0.05$ ) higher than that in the BL group (3.0–3.9 seconds). Finally, significantly higher IFH gains were observed in the FB group ( $p = 0.004$ ), with a mean gain of 26 seconds, but not in the BL group ( $p = 0.168$ ). These results suggest that FB is highly effective in increasing grip strength and endurance in competitive BL.

**KEY WORDS** hangboard, dead hangs, finger hangs

## INTRODUCTION

**B**ouldering (BL) is an independent discipline of sport climbing undertaken without ropes on approximately 4-m-high artificial walls with landing mats to ensure safety (5,7,11,24). The ongoing popularization and professionalization of BL (5,9,17) have raised questions regarding how to maximize individual performance during competition (11,13). The use of steep overhanging artificial BL walls requiring an average of 4 to 8 strenuous climbing movements suggests that maximum grip strength is a key factor in competitive BL (5,7,9,11,13,24). Pieber et al. investigated injuries and overuse syndromes in the Austrian climbing society ( $n = 193$ ) and observed that 71.1% of the 374 recorded injuries affected the upper extremities and that 30.7% were strains or ruptures of the annular ligaments or tendons of the fingers. Moreover, the authors concluded that the incidence of climbing-related overuse syndromes is dependent on gender, age, and exposure to climbing stress but is not specific to the climbing and BL disciplines.

In addition to grip strength, competitors generally require multiple attempts to climb a boulder (11,24), with attempts lasting up to 40 seconds (11,24), and the rotation system in competitive BL imposes limited recovery time between 2 boulders (7,24). White and Olsen found that successful ascents in elite competitive BL lasted an average of  $39.5 \pm 4.1$  seconds and that athletes attempted a boulder  $2.8 \pm 1.7$  times. In conclusion, high-intensity forearm muscle contractions, repeated over a relatively long period and separated by short rest periods, suggest that grip endurance can be considered an additional key factor and that rapid recovery after attempt is of particular importance in competitive BL (8,11,14,24).