

## Abstract

**Title:** Critical power and force during continuous and intermittent contractions of finger flexors

**Objectives:** The aim of the study was to determine critical force of finger flexors during continuous exercise and to determine critical power at different work - relief ratios during intermittent exercise.

**Methods:** Eight participants volunteered in the study (age  $23,1 \pm 1,8$  years, height  $172,9 \pm 7,3$  cm, body mass  $67,1 \pm 4,8$  kg, climbing experience  $5,4 \pm 2,1$  years and climbing performance from 6 to 8 on the Union International des Associations d'Alpinisme scale). Participants undertook one continuous and three intermittent handgrip contractions (work to relief ratio of 8:2, 7:3, 6:4) to failure at 60% and 40% maximal voluntary contraction (MVC) for dominant and non-dominant hand, respectively. For continuous contraction, the critical force was calculated from two exercises at 40% and 60% MVC and inversed time to failure using linear regression analysis; for intermittent contraction, the critical power was calculated from the three contraction ratios and inversed time to failure using linear regression analysis.

**Results:** Critical force for continuous contraction was found at  $20,4 \pm 5,9$  % MVC. The critical power for intermittent contractions was considered not to be valid and is not indicated.

**Conclusion:** The results point out problems of critical power determination in continuous and intermittent exercises of finger flexors. Due to number of methodological difficulties, it is first of all necessary to establish a clear standardized protocol to obtain valid results. However, the results indicate that the critical force for continuous load is around 20% MVC.

**Keywords:** critical force, sport climbing, izometric contraction, hand dynamometry