

## ABSTRACT

**Title:** Local and global effect of sub-maximal squat on post-activation enhancement of muscle power output.

**Objectives:** The aim of this thesis is to determine whether the phenomenon of post-activation performance enhancement (PAPE) manifests locally or globally in terms of improved muscle power output. That is, to determine whether activation of a complex muscle chain will lead to improvements in the muscle power output of other muscle groups and muscle groups included in the activated muscle chain. In this way, to indicate the relationship between global and local physiological mechanisms causing PAPE.

**Methods:** The quasi-experimental method and the method of analysis were used in this work. Eleven basketball players aged 18-28 years completed two measurements in random order. The measurements started with a non-specific warm-up followed by a pre-activation test (pre-CA) to obtain baseline values. Next, the players performed a specific warm-up and activation exercise (CA) in the form of a squat with an intensity of  $2 \times 4 \times 90$  % of one repetition maximum (OM) with a rest interval of 3 min. After the activation exercise, post-CA values were measured at minutes 5, 8 and 11 on force plates and at minutes 6, 9 and 12 on an isokinetic dynamometer (IKD). Pre-CA and post-CA test of the protocol one consisted of countermovement jump (CMJ) and knee flexion and extension measurements at  $180^\circ/\text{s}$  angular velocity. The protocol two tests consisted of measuring explosive push-up (EPU) parameters as well as flexion and extension at the elbow at an angular velocity of  $180^\circ/\text{s}$ . The measurements were analyzed using the paired t test for normally distributed data and the Wilcoxon paired test for non-normally distributed data.

**Results:** Pre-CA and post-CA analysis of knee flexion and extension values revealed a significant ( $p < 0.05$ ) increase in the parameters of peak torque (PT) and average power per 1 repetition (APPR), while no significant change was observed in CMJ parameters. Pre-CA and post CA measurements of elbow flexion showed a significant decrease in PT and APPR parameters. No significant difference was found for the EPU parameters. The results suggest that activation exercise targeting lower body muscle groups does not affect post-activation of upper body muscles. In terms of its extent, the PAPE effect appears to be primarily local.

**Keywords:** complex training, post-activation potentiation, explosive power