

## **Abstract**

This diploma thesis focuses on examining the effects of an exercise protocol on upper limb performance. Exercise protocol was based on the principle of voluntary muscle activation in the distal direction. The theoretical part sets out the theoretical basis necessary to place the approach in the phylogenetic, anatomical and kinesiological context. The study develops a view of the motor mechanism contained in our neuromotor system and is nevertheless very little taken into account in modern physiotherapy. The main aim of the study was to determine the relevance of the effect, in terms of upper limb performance, in the short-term application of an exercise protocol based on the mechanism of voluntary muscle activation in the distal direction.

**Methods:** A total of 20 patients who met the study requirements were enrolled in the study, with only 17 of them (mean age 24.6; SD  $\pm$  1.6) completing the entire program and therefore the results of only these probands were evaluated. They were randomly divided into two groups in a 1: 1 ratio. Group A performed assignments in the form of a five-minute exercise protocol based on the mechanism of distal muscle activation on a daily basis, and an identical exercise plan with the opposite direction of commands was presented to group B. As part of the measured factors the maximum compression force was tested using a hand-held dynamometer. Strength endurance was then tested by measuring endurance in the static positions of bodyweight exercises. The aim was to determine whether motor input on the basis presented in the study has the potential to positively affect upper limb performance and whether this potential is a direct consequence of the direction in which muscle activation is conducted which was the reason of a control group with commands executed in opposite directions.

**Results Conclusion:** Based on our results, we confirmed that the exercise protocol had a statistically significant effect on upper limb performance. Compared to the control group the assumption of a greater effect was confirmed in group A but the statistically relevant difference in improvement between the groups was confirmed only in the endurance test of holding the lower position of the push-up. Thus our hypothesis was only partially confirmed but due to the size of the sample it is not possible to evaluate the data only from a statistical perspective.