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Electromyographic analysis of the up and down step: comparative dry and water
The aim of the present study was to compare the muscular activity with surface electromyography of the lower limb and the trunk muscles during up and down step in dry land and into the water environments comparing young and elderly population.

Methods: An analytical cross-sectional inferential study was carried out in order to compare the muscle activation between dry land and aquatic environments.

Sixteen non-pathological subjects participated in the present study. Eight muscles were recorded in a telematic and simultaneous manner by immersing the device in water (if necessary) with a sampling frequency of 1000 Hz. The functional task up and down step was performed at a rhythm of 5 repetitions at 25 BPM (measured using a metronome), the height of the step was 18 cm. The task was performed both in dry and in water with the same height of the step and the same rhythm in both environments. The waterline was in one meter, water

temperature was 30°C. Results: In older people, significant differences between dry and water during up step in the distribution of muscle activation were found. Young groups shown significant differences in all muscles analyzed with the exception of the spinal erector. However, for the down step in the group of young people (table 3), significant differences were observed for all muscles except for the musculature of the trunk and rectus femoris. In the aquatic environment, elderly group showed significant differences for the muscle activation compared to the young for all muscles of the thigh and leg except for the tibialis anterior during up step task. However, in the down step in the aquatic environment, only significant differences were obtained in favor of the elderly group in the musculature of the thigh.