

An evaluation of the effects of cerebral stimulation on motor learning of adolescents practising judo

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Abstract The objective of the present study was to evaluate the influence of a programme of training with cerebral stimulation by auditory stimuli on motor learning in the practice of judo. Twenty adolescents of 12–14 years of age were selected and were divided into an Experimental Group (EG) and a Control Group (CG), the EG realising a programme of 36 sessions of judo training of 45 min duration, parallel to a programme of training with cerebral stimulation by auditory stimuli of 35 min duration. The CG realised only the judo programme with the same number of sessions of the same duration. The pre- and post-programme data revealed that the EG, which used both the programme of judo training and the programme of training with cerebral stimulation by auditory stimuli, was significantly superior to the CG ($p \leq 0.05$) in relation to performance in learning and memorisation. It is concluded that the results described here

are substantial regarding the interactivity between a programme of training with cerebral stimulation, and motor learning and memorisation.

Key words Evaluation · Motor conduct · Motor learning · Judo · Cerebral stimulation

Introduction

Learning and memory are correlated and inseparable processes. Learning corresponds to the acquisition of new knowledge and consequent modification of behaviour, while memory may be understood as the retention of this knowledge. Thus, both processes share similar neural mechanisms that participate equally in the control of attention, sensorial integration and perception [1, 2].

The phase of motor learning results in motor memory, also known as procedural memory. The improvement of performance, which increases the precision of the motor gesture, fundamentally depends on the memory of these procedures [3].

Procedural memory may be understood as indispensable to the organisation and acquisition of a motor or sensorial ability that we normally call “habit” and which comes from experience. This, in turn, may result from active learning or from living in circumstances enriched with individuals, colours, music, sound, books, scents, etc. that serve as neural stimuli. When a cell is activated, it releases chemical substances in the synapses, called neurotransmitters, making them more effective. “Excited” neurons possess a greater number of ramifications (dendrites), communicating with dendrites of other neurons [4].

Thus, for memories to be created, it is necessary that the nerve cells form new interconnections and new mol-

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