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SEMG for Training Awareness and Muscle Relaxation During Toe Touching

Jourdan Mcphetridge, Erin Thorne, Erik Peper, and Richard Harvey

San Francisco State University, USA
E-mail: epeper@sfsu.edu

Many people are unaware of muscle tension when performing tasks. This often results in fatigue due to excessive energy expenditure—a process that has been labeled as dysponesis or dysponetic muscle activity. This study investigated whether college students were aware of their neck and back muscle tensions while performing a simple task of bending forward and touching their toes. Twelve participants consisted of five men and seven women (mean age of 23.8 years). Muscle tension was recorded with surface electromyography (SEMG) from the neck. The procedure consisted of three steps: (1) a preassessment consisting of standing relaxed, then bending forward to touch their toes while being totally relaxed, then gently coming back up to standing position, followed by a rating of their subjective experience; (2) SEMG feedback training to reduce SEMG while bending forward and touching their toes until they could successfully relax their neck and back muscles while hanging down; and, (3) a post-assessment, which was the same as the pre-assessment. SEMG during the post-assessment hanging down was significantly lower (mean = 2.2 lV) than the pre-assessment (mean = 10.5 lV) (p\ 0.01). The subjective awareness of neck and back muscle tension correlated higher during the post-assessment than pre-assessment. The post-assessment SEMG levels decreased while moving from standing position (mean = 3.9 lV) to the hanging down position (mean =2.2 lV), while the pre-assessment SEMG levels increased while moving from standing position (mean = 4.1 lV) to hanging down position (mean = 10.5 lV). Eleven out of 12 subjects reported being totally surprised to observe that their neck SEMG showed muscle tension and was not relaxed during the pre-assessment because they had rated their muscles being totally relaxed. Physical flexibility was negatively correlated with the number of SEMG feedback training trials to master neck and back relaxation. The subjects reported that the SEMG feedback increased their self-awareness of muscle tension, which allowed them to more deeply relax, as well as to apply the somatic awareness to other activities. We recommend that SEMG training be used to enhance awareness and reduce dysponesis during yoga, stretching, and other physical activities.