LD (t=3.264), GM (t=4.077) and DA (t=4.844). The 2 handled bar height positions with a short size frame showed differences ($p<0.05$) in GM (t=4.6) and DA (t=2.56). TD (t=1.78) and LD (t=0.586) revealed no significant differences. The handled with a long size frame presented differences ($p<0.05$) in TD (t=2.98) and GM (t=3.11), and no differences in LD (t= 1.486) and DA (t=1.47). This study revealed that consecutive changes handlebar height and bicycle frame length over time lead to increase in discomfort during cycling.

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Muscle activation levels during the push-up exercise on stable and unstable surfaces

Carolina Vila-Chã[1,2], Luís Ribeiro[1], Nuno Serra[1], Mário Costa[1,2], Filipe Conceição[3], José António De Paz[4]

1. Polytechnic Institute of Guarda, Guarda, Portugal; cvilacha@ipg.pt; 2. Research Center in Sports Sciences, Health and Human Development, CIDESD, Vila Real, Portugal; 3. LABIOMEP – Universidade do Porto; 4. Institute of Biomedicine, Universidad de León

The push-up (PU) is one of the most common exercises used in the strength training programs for the upper body. Since it is limited to the body weight, fitness trainers use several exercise types (e.g. unstable surfaces) in order to increase the activity of the involved muscles (Freeman et al., 2006). This study aimed to analyze the changes in muscle activity pattern induced by either performing PU exercise on a stable surface (ground) or an unstable surface (BOSU®). Eleven voluntary male subjects (age, mean ± SD: 21.9 ± 4.2 yrs.), familiarized with the push-up's exercises, have been recruited for this study. Subjects performed 5 repetitions of each push-up exercise (stable vs. unstable surfaces. Electromyographic activity (EMG) from the agonist muscles (clavicular, sternal and chondral portion of pectoral major, triceps brachii and anterior deltoid), antagonist muscles (latissimus dorsi and biceps brachii) and the stabilizer muscles (serratus anterior, superior trapezius, external oblique and erector spinae) has been collected with 11 wireless surface electrodes. The results showed that, from the agonist group, only the magnitude of activation of the triceps brachii has been affected by the exercise type ($p < 0.001$). In the unstable PU the triceps brachii showed higher activation levels than in stable surface (70.13 ± 29.03% and 58.62 ± 25.31%, respectively). Regarding the antagonist group, the unstable PU exercise induced a higher activity of the brachial biceps and of the latissimus dorsi compared to the stable PU exercise ($p <0.05$ for both muscles). In addition, for stabilizer muscles, it was observed that the upper trapezius activation was, on average, 37.79% higher than in the stable exercise ($p <0.01$) during unstable PU. Instead, for the serratus anterior, the activation level was, on averaged, significantly higher in the unstable PU exercise than in the stable PU (+ 14.71%, $p = 0.01$). For the external oblique there were no differences between exercise types ($p = 0.23$). However, the activity of the erector spinae was significantly higher in unstable PU ($p = 0.01$). These results indicate that the push up exercise performed on an unstable surface (BOSU®) changes the pattern of activation of antagonist muscles, shoulder stabilizer muscles and agonist muscles, particularly the brachial triceps activation.

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EMG of trunk muscles compared with the pedaling power of and cyclist position: A case of study

Vítor Milheiro[1], Ana Conceição[1,2,3], Hugo Louro[1,2], Marco Branco[1], Brito, João[1,2]

1. Sport Sciences School of Rio Maior, Rio Maior, Portugal; conceicao.ana@gmail.com; 2. Research Center in Sports Sciences, Health and Human Development, CIDESD, Vila Real, Portugal; 3. CIEQV-Life Quality Research Center, Santarém, Portugal.

Over the past decades, have been published numerous biomechanical studies to optimize the performance and the prevention of cyclists' injury. Many of these studies have used electromyography (EMG) to analyze the effects of the cyclist position and bike geometry on kinematics, kinetics, muscle activation and energy expenditure. Most EMG studies in cycling has analyzed the lower limb (Hug, 2009), with few analyzing trunk and upper limbs EMG activity. The aim of this study was to analyze trunk muscles involvement in a recreational cyclist, as a result of bike fit and pedaling power.,The sample consisted of one male recreational cyclist, 20 years old, 1.82m and 76kg, which was shot while riding a bicycle supported on a roller equipped with a PowerTap potentiometer and allowed two handlebar positions and two frame lengths. Using a wireless signal acquisition system (bioPlux research, Portugal), surface electromyogram was collected in four muscles: deltoid anterior (DA), trapezius descendens (upper) (TD), gluteus maximus (GM) and latissimus dorsi (LD).