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

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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

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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).

Kinematic data were analyzed using the APAS software and the average amplitude of EMG of each active phase was estimated using the average rectified value (ARV) and plotted as a function of time. In kinematic analysis, we verified that trunk-horizontal angle (53.0° ± 4.9°) were slightly higher in the long-frame situation. By analyzing the variations of the trunk-horizontal angle with handlebar height, the results showed large differences between the handlebar high situation (56.6° ± 3.7°) and low (49.3° ± 2.5°). Regarding the trunk-upper limb angle (77.8° ± 4.81°), the results show always higher values in longer above situation. The elbow angle was always lower in high handlebar situation (124.1 ° ± 17.9 °) compared to the low handlebar (142.8° ± 9.7°). In terms of electromyography ARV data, we found that GM values were higher in higher power cycling situation and in longer frame position. When analyzed ARV of DA muscle and frame size the data show higher values in higher power cycling situation and the short frame position. This study showed that the stroke pedal kinematics varies with bike geometry changes and is also very influenced by pedaling power. The great variability of EMG data only possible to analyze the gluteus maximus and deltoid muscles and the influence of kinematic parameters in the range of muscle activation.

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Analysis of internal load in indoor cycling

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The analysis of the dynamics of external and internal load in cycle indoor (CIn) is very importance to guide the instruction during a cycling indoor class. To quantify the individual load carried by and the perception of this with the effort put in will allow you to tailor the response of cardiorespiratory and metabolic during the class. The internal load will be quantified by the heart rate (HR) and the forces applied over a force plate. These parameters will be used as objective parameters of the internal load, while in the exercise room, the reading of the HR is the most used, and in this sense, we will base the analysis of the internal load, essentially in the parameter of physiological HR and less in the load held in Newtons on the force plate. The aim of this work was to examine the response to the effort made by the participants of the CIn, based on internal and external load produced, relating to the perceived exertion (PSE). The PSE was the scale used to regulate the intensity used by the performer over the tests. Voluntarily participated in this study, 13 men (33.7 ± 7.3 (years); 74.3 ± 7.6 (kg); 176 ± 6.3 (cm)) and 15 women's (31.5 ± 6.3 (years); 59, 7 kg ± 6.7 (kg); 166 ± 4.5 (cm)). The participants were divided into two distinct groups (randomly). One of the groups (A) was informed, during the first assessment, about the intensity and the way should regulate over the tests, as well as, should remain in future class respecting these intensities according to the different levels and according to the scale of perceived exertion. Nothing was said to the second group (NA), leaving to the discretion of the participants the load regulation during the tests and CIn class. The main result of this research was that the Group (A), differed significantly the different levels requested, on the contrary the Group (NA) was not able to differentiate the different intensity levels during the test. The lack of instruction on how to act and to keep a good PSE between the two assessments does not promote similar behaviour in the group, thus reinforcing the need to teaching the scale PSE during cycle class.

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Maximum and mean force relationship to body composition in swimmers

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In swimmers, a low level of body fat and a high quantity of lean mass could generate an increase in higher energy expenditure and loss of performance, on the other hand, high levels of body fat increase the contact