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OP-PM41 Training & Testing: Strength II

EFFECTS OF BODY POSITION ON FORCE EXERTED DURING SUSPENSION TRAINING

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Introduction Suspension training (ST) has become a popular form of bodyweight resistance training, eliciting higher muscle activations with respect to traditional exercises due to muscle activity used to maintain body stability and balance (McGill et al 2014; Snarr et al 2014). The load applied on upper and lower body can be modified by moving the center of mass outside of the base of support by changes in straps length and/or feet placement. Therefore, the aim of this study is to evaluate the effects of different body positions on force exerted on upper and lower body during a static push-up position performed on a ST device. Methods After giving his informed consent of participation, a highly experienced (i.e., 5 years) ST instructor (age 48years; height 186cm; weight 78Kg) performed 12 isometric (upper limbs extended and flexed at 90°) push-up positions with different straps lengths according to the individual body height (SL%). A force plate (Twin Plates Globus, Treviso, Italy) and a piezoelectric force transducer (ISO Control Globus, Treviso, Italy) were used to evaluate the ground force (LBF) and that applied to ST (AinS Suspension Training System FIPE, Rome, Italy) device (UBF), respectively. Video recordings were analyzed to verify body alignment and to calculate body inclination (BI). Pearson correlation ascertained the relationship ($p<0.05$) between BI, SL%, LBF, UBF and total force (TF=LBF+UBF). Results Regardless of upper limbs position, high correlations ($p<0.0001$) between variables emerged. UBF (mean=41.7±10.5kg, range=20.0-53.9kg) was highly related to LBF (r=-0.996; mean=49.1±7.1kg, range=40.6-64.0kg), BI (r=-0.980; mean=31.6±14.2°, range=17.0-62.9°), and SL% (r=0.907; mean=146.4±25.0%, range=100-163%). LBF and TF (mean=90.8±3.5kg, range=84.0-95.8kg) were highly related to BI (LBF: r=0.983; TF: r=-0.952) and SL% (LBF: r=-0.901; TF: r=0.897). Discussion Body position is highly related with increased load on upper body. In particular, TF tends to increase towards horizontal positions, substantiating a greater muscle activation to maintain body stability (McGill et al 2014). Therefore, body position should be modified during ST to guarantee load progression and effects on strength gain comparable to traditional resistance training (Matè-Munoz et al 2014; Janot et al 2013). References Janot J et al 2013 J Fitness Res 2:23-38 Matè-Munoz et al 2014 J Sports Sci Med 13:460-468 McGill SM et al 2014 J Strength Cond Res 28:105-116 Snarr RL et al 2014 J Sport Human Perf 2:1-8 Contact c.cortis@unicas.it