

WORK IS A MORE RELIABLE ESTIMATOR THAN HEIGHT OF COUNTERMOVEMENT JUMP PERFORMANCE

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Introduction

Since the early 80s that 'Bosco Tests' are commonly used all over the world. Indeed, most coaches rely on the countermovement jump (CMJ) to evaluate muscular power of the lower limbs. This is acceptable because in short activity patterns muscular power plays a major role. In fact, it is assumed that there is a good correlation between lower limb maximum power and maximum jump height. Results of CMJ are usually expressed in height, i.e., the vertical displacement of the centre of mass. However, this parameter does not take into account the mass of the subject. Thus, the purpose of the present study was to analyze the possible relationships between height and work of the CMJ and power in Squat.

Methods

Forty-two national level swimmers (22 male and 20 female; age: 15.6 ± 1.8 years; body mass: 57.4 ± 9.5 kg; height: 1.68 ± 0.13 m) volunteered as subjects. The height in the CMJ was obtained using the jump fly time (ErgojumpTM, Italy). Work was calculated according to $W = m \cdot g \cdot h$. Using a dynamic measurement system (T-Force System, Ergotech, Spain), each participant executed n incremental repetitions (5 min rest) in Squat to assess average propulsive power. After Shapiro-Wilk normality test, Pearson's correlation coefficient (r) was used to establish relationships between variables. The level of statistical significance was set at $p < 0.05$.

Results

The height assessed in the CMJ was 0.34 ± 0.09 m, being calculated the correspondent work of 209.5 ± 36.6 J. Maximum value of average propulsive power was 355.33 ± 56.4 W. Significant correlations were observed between power in squat with CMJ height ($r = 0.64$, $p < 0.05$) and work ($r = 0.92$, $p < 0.001$).

Discussion

The high correlation between height and work ($r = 0.88$, $p < 0.001$) in CMJ can induce that both variables are good estimators for performance. Moreover, the generally used equipments to evaluate CMJ provide the height of jump immediately. However, not taking into account the mass of the subject does not seem the most accurate procedure. Indeed, power presented higher correlation with work than with height, inducing a more reliable estimator for performance in the gym exercise. These data corroborate the findings of Morouço et al. (2011), which reported higher correlations between work and swimming performance parameters, than with height. Coaches evaluating CMJ should take in account the mass that the subject must overcome, with the aim of having a more trustworthy estimator of muscular power.

References

Morouço P, Neiva H, González-Badillo J, Garrido N, Marinho D, Marques M. (2011). J Hum Kinet, SI, 105-112.

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