

STRENGTH POTENTIAL OF YOUNG MEN AND WOMEN

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INTRODUCTION: Muscle strength is a basic human feature. It may be diagnosed through fitness tests or through dynamometry of muscle groups. Measurements of several muscle groups at a time with a back dynamometer, or a shoulder dynamometer (strain gauge or inertial dynamometer) can not answer which element (which muscle group) is the weakest within the entire chain. An approach proposed by Fidelus (1967) takes into account the capabilities of isolated muscle groups. This approach is widely used all over the world. Fidelus proposed assessment of 10 muscle groups acting in the sagittal plane. These are the flexors and extensors of: forearm, arm, foot, calf, thigh, and trunk. Multiplying a value of resistance force read-out from the dynamometer by a moment arm one can obtain a value for the moment of force. This moment is equal to the moment of muscle strength. Unfortunately, this approach did not allow to obtain a value of muscle strength alone, since one did not know a value of muscle strength lever arm. Contemporary knowledge gives us a possibility of obtaining data on muscle strength lever arms of some joints – Erdmann (2001). The aim of this paper is obtaining data on muscle strength for main body parts of contemporary young population.

METHODS: Students (21 yrs. old) of physical education major without special sport training participated in the investigations (126 men and 89 women). Three muscle groups were investigated: 1) forearm flexors in the elbow joint (EF), 2) calf extensors in the knee joint (KE), 3) trunk extensors in the lumbar intervertebrate joints (umbilicus level) (LE). Special stands were used for measurements of dynamometric resistance force – Figure 1.

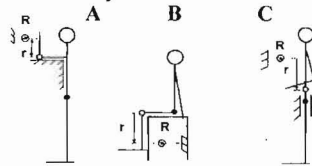


Figure 1. Muscular strength investigation stands for: A – forearm flexors, B – calf extensors, C – trunk extensors. R – resistance force, r – lever arm; dashed lines – stabilization.

RESULTS: Figures 2 and 3 present absolute and relative data on moments of force and on strength of three basic muscle groups of men and women.

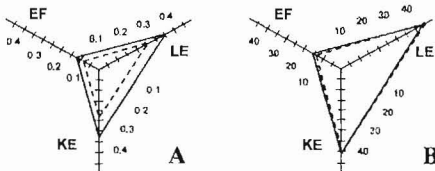


Figure 2. Moment of force divided by weight: A - absolute [Nxm/N], and B - relative [%]. Solid lines – men, dashed lines – women.

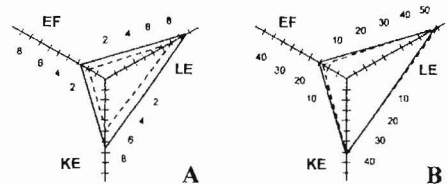


Figure 3. Strength divided by weight: A - absolute [N/N], and B - relative [%]. Solid lines – men, dashed lines – women.

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