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THE SELECTION OF A METHOD FOR ESTIMATING POWER OUTPUT FROM JUMP PERFORMANCE

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SUMMARY

The purpose of this study was firstly, to evaluate the power output of leg extensor muscles in a Counter-movement jump test (CMJ) and in a Squat jump test (SJ), in four groups of young women with different levels of physical activity. Secondly, to obtain power regression equations for the power developed in the CMJ, in the four groups. Forty-six young women volunteered for the study. They were divided into 4 groups: 12 elite volleyball players (Elite); 13 club level volleyball players from a national level team (Medium); 10 physical education students (Students); and 12 sedentary university students (Sedentary). Peak power values measured on the force platform (Elite: 2997 ± 420 W in CMJ and 3109 ± 420 W in SJ; Medium: 2856 ± 554 W in CMJ and 2879 ± 539 W in SJ; Students: 2415 ± 316 W in CMJ and 2423 ± 277 W in SJ; and Sedentary: 2400 ± 395 W in CMJ and 2322 ± 355 W in SJ) were greater than those assessed with the power equations in most cases. There were significant differences ($P<0.001$) between the power measured and estimated from the equations, in all except the Sayers equation in the CMJ. This equation was the most accurate, compared to the values measured on the force platform. As jump performance of the subjects increased, the equations underestimated less peak power. Further studies should determine power equations adapted to the characteristics of different groups from those analysed in this study.

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INTRODUCTION

Mechanical power is an essential variable for the performance in sport and in daily activities, and has been extensively researched for over many years. Jump tests have been frequently used to evaluate peak power output from lower limb extensor muscles. These tests can be performed in little space, and have simple and standardised protocols, thus they are widely used by researchers and coaches. Nowaday, there are instruments available, like force platforms, that allow to measure power directly, and can be used in the field, taking measurements during a training session or in the rest periods of a competition.

When direct measurements of power are not available, power equations can be utilised, which estimate peak power from jump height and subjects' body mass (Table 1). Some of these equations have been

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ABBREVIATIONS:
CMJ counter-movement jump
SD standard deviations
SJ squat jump

KEY WORDS:
force platform
jump tests
peak power
power equations.

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