

ACCELERATION & SPEED as predictors of VERTICAL JUMPS performance in female adolescents

Tijana Stojanović

Faculty of Sport and Physical Education, University of Niš

Background

In the context of a public health physical fitness examination in adolescence, a countermovement jump (CMJ) and a squat jump (SJ) are two vertical jump tests widely used to evaluate lower limb muscle strength and power.

Also, assessment of physical fitness and the identification of performance predictors are important for the selection and screening of young athletes.

Aim

The purpose of this study was to investigate: (1) relationship between acceleration and speed with vertical jumps performance, and (2) predictability of vertical jumps performance from acceleration and speed abilities.

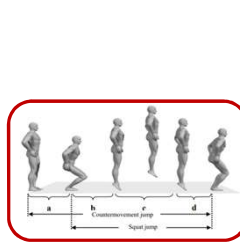
Materials and methods

Subjects: 40 female elementary school students (Age: 13±0.5 years).

Instruments: 5, 10 and 20 m sprint times; Squat Jump (SJ) and Countermovement Jump (CMJ).

Statistical analysis: Descriptive statistics, Pearson correlation analysis, Multiple linear regression – stepwise.

Results



All predictors showed significant correlations with SJ and CMJ, but the strongest negative correlations were found between 20-m sprint times and **SJ ($r = -0.71$)**, and **CMJ ($r = -0.61$)**.

Stepwise regression showed that 20-m sprint time was the best single predictor of SJ with **50%** explained variance.

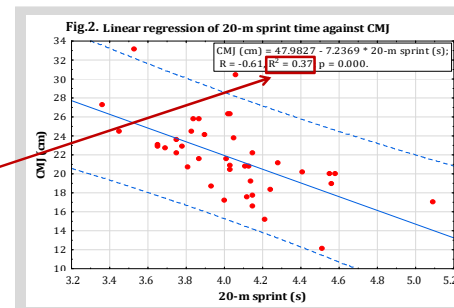
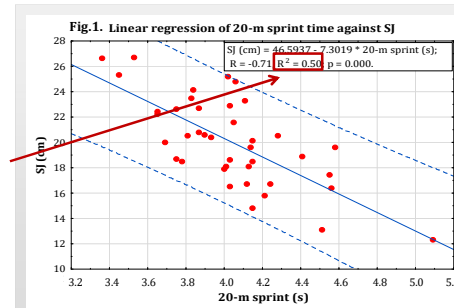
Table 2. Pearson's correlations (r) between sprint times and vertical jumps

	SJ (cm)	CMJ (cm)
5-m sprint (s)	-0.478*	-0.400*
10-m sprint (s)	-0.593*	-0.491*
20-m sprint (s)	-0.709*	-0.606*

Stepwise regression showed that 20-m sprint time was the best single predictor of CMJ with **37%** explained variance.

Table 1. Descriptive statistics

Variables	Mean	Std.Dev.	Min	Max	K-S (d)
5-m sprint (s)	1.31	0.12	1.11	1.62	0.084
10-m sprint (s)	2.20	0.17	1.93	2.60	0.107
20-m sprint (s)	4.03	0.34	3.36	5.09	0.138
SJ (cm)	20.07	3.473	12.30	26.70	0.067
CMJ (cm)	21.70	4.029	12.10	33.10	0.068



Conclusions

The results of this study demonstrate that:

- 20-m sprint performance is strongly related to vertical jump performance;
- 20-m sprint time is best single predictor of vertical jump height in female adolescents.

These findings can be useful for physical education teachers for physical fitness assessment and identification of talented students for engagement in sports.

Also it can be useful for coaches when they create training programs for their young female athletes.



THE SEVENTH INTERNATIONAL SCIENTIFIC CONFERENCE
"ANTHROPOLOGICAL AND TEO-ANTHROPOLOGICAL VIEWS ON
PHYSICAL ACTIVITY FROM THE TIME OF CONSTANTINE THE GREAT
TO MODERN TIMES"

