The Influence of Latent Dimensions of Specific Motor Abilities on the Situational Motor Skill-Spike of Youth Female Volleyball Players

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The Influence of Latent Dimensions of Specific Motor Abilities on the Situational Motor Skill-Spike of Youth Female Volleyball Players: *The aim of this research is to establish the influence of latent dimensions of specific motor abilities on the situational motor skills. The research was conducted on a sample of 168 female volleyball players, members of youth teams and participants of national championships of R. of Macedonia at 14 to 17 years of age. Twenty variables were implemented in the research, of which 18 estimated specific motor abilities and 2 estimated situational motor skills. After the results that were obtained with linear regression analysis, we concluded that there is significant influence of latent dimensions of specific motor abilities over situational motor skills.*

Key word*: volleyball, specific motor abilities, situational motor skills, linear regression analysis*

INTRODUCTION

Volleyball is a sport that undergoes continuous transformation and in the process of its development reaches a level of Olympic sport all over the world. Volleyball is sport with poly-structural complexity of the game that requires efficient realization of the mutually dependable technical and tactical elements.

Many authors are studying sports activity as a specific human activity. They emphasize the role of all factors for active and success participation in creation of top sports results and the need for their specific integrity.

Realizing the importance of information about the motor potential, which can contribute to better understanding of efficiency in the implementation of various motor tasks, this research will determine the influence of latent dimensions of specific motor abilities over situational motor skills, spike from zone 4 and zone 2, with young volleyball players in Macedonia.

EXPOSITION

Methods

The research was conducted on a sample of 168 volleyball players, members of the youth and junior teams participating in the national championships of Macedonia in the 2008/09 competition season. Examinees were female between 14 and 17 years of age and came from several cities: Skopje, Veles, Strumica, Prilep and Tetovo.

The research applied a system of 20 variables, of which 18 for assessment of the specific motor abilities and 2 for assessment of the situation motor skills.

The following tests were applied in order to perform assessment of the specific motor abilities: 1.Reach height at spike 2.Reach height at block 3.Standing long jump 4.Throwing medicine ball from chest from place 5.Throwing medicine ball overhead with jump 6.Handgrip strength test 7.Sit-ups in 30 seconds 8.Back extension in 30 seconds 9.Push-ups with knees on the floor 10.Hand tapping 11.Double hand tapping 12.Foot tapping against the wall 13.20 meters sprint 14.Japan test 15.T – test 16.Sitting on the ball 17.9-3-6-3-9 meters fast running and 18.9 meters backward fast running.

These tests are used in large number of researches by many authors. However, this individual research includes tests applied by several authors: reach height at spike, reach height at block, throwing medicine ball from chest from place, throwing medicine ball overhead with jump and 9 meters backward fast running from author Milenkoski (1999)[1], Japan test, sitting on the ball and 9-3-6-3-9 meters fast running from the authors

[1]Milenkoski, J. Relations and difference of some cognitive, specific motor abilities, conative characteristics and……(1999)

Bachmann, Edi & Martin (1992)[2], standing long jump, hand tapping, double hand tapping and foot tapping against the wall form the authors Katić, Grgantov & Jurko (2006)[3], T – test from the authors Vanderfort & al. (2004)[4] and 20 meters sprint, handgrip strength, sit – ups, back extension and push-ups with knees on the floor form the EUROFIT kids program.

Tests for assessment of situation motor skills, precision of spike from zone 4 and zone 2 are undertaken with certain modifications from authors Srahonja, Janković and Šnajder (1982)[5].

In order to determine the influence of latent specific motor factors on variables for assessment of the situation motor skills, the factor scores of each examinee is initially calculated in the obtained latent factors. Next step is application of the linear regression analysis, where latent specific motor factors are treated as predictors, and individual variables for assessment of the situation motor skills as criteria.

Results and discussion

From the application of the component factor analysis it is determined that in the structure of specific motor abilities of young female volleyball players there are four latent factors: factor of agility (F1), factor of explosiveness of the extremities (F2), factor of frequent speed of extremities (F3) and factor of repetitive strength of body and hands (F4).

Table 1 presents results of the regression analysis in the precision of spike from zone 4 (SMCH4), whereas it shows that between the predictor system and the criteria SMCH4 there is statistically significant relation at the level of Q(F)=.00 (R=.480). This points to the fact that with the latent specific motor factors 21% of the variance of the criteria SMCH4 (DELTA=.21) can be explained. The remaining 79% of the total variance of the criteria variable can be prescribed to other characteristics and abilities of examinees that are not subject of our research.

Table1

Regression Analysis of Latent Specific Motor factors on the SMCH4 variable

SMCH4	Correlations		Non-standardized Coefficients		Standardized Coefficients		
	r	Part-R	B	SG	Beta	t	Q(B)
FACTOR_1	.291	.196	.765	.299	.193	2.557	.011
FACTOR_2	.425	.389	1.518	.281	.382	5.398	.000
FACTOR_3	.136	.116	.413	.278	.104	1.486	.139
FACTOR_4	.107	-.027	-.100	.292	-.025	-.342	.733
R=.480	DELTA=.211		SIGMA=3.526		F(4,163)=12.189		Q(F)=.000

Regression Analysis of Latent Specific Motor factors on the SMCH4 variable

Monitoring partial regressions (Beta) coefficients of the predictor system, it can be noticed that only the first and the second latent factor (agility and explosiveness of the upper and lower extremities) have individual statistically significant contribution to the elaboration on the criteria SMCH4 at the level of Q(B)=.01 and Q(B)=.00.

Table 2 present the regression analysis of the variable precision of spike from zone 2 (SMCH2). Inspection thereof shows that between the predictor system and criteria

3

4

SMCH2 there is statistically significant relatedness at the level of Q(F)=.00 (R=.436). This points to the fact that the specific motor latent factors can explain 17% of the variance of the criteria SMCH2 (DELTA=.17). The remaining 83% of the total variance of the criteria variable can be prescribed also to other characteristics and abilities of the examinees subject to our research.

Table2

Regression Analysis of Latent Specific Motor factors on the SMCH2 variable

SMCH2	Correlations		Non-standardized Coefficients		Standardized Coefficients		
	r	Part-R	B	SG	Beta	t	Q(B)
FACTOR_1	.185	.084	.336	.314	.083	1.073	.285
FACTOR_2	.412	.392	1.602	.295	.395	5.436	.000
FACTOR_3	.127	.122	.458	.291	.113	1.573	.118
FACTOR_4	.070	-.028	-.109	.306	-.027	-.355	.723
R=.436	DELTA=.171		SIGMA=3.693		F(4,163)=9.590		Q(F)=.000

Monitoring partial regressions (Beta) coefficients of the predictor system, it can be noticed that only the second latent factor (explosiveness of upper and lower extremities) have an individual statistically significant contribution in the elaboration of the criteria SMCH2 at the level of Q(B)=.00.

CONCLUSIONS

The results from this research show that there is significant influence of latent dimensions of specific motor abilities on the situational motor skills.

Although the coefficients of multiple correlation (R) with both criteria variables are statistically significant, the low coefficient of determination, moving from 17% – 21% leads us towards to fact that this system of predictors should be enriched with additional motor abilities in order to obtain improved predictor value.

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The report has been reviewed.