THE INFLUENCE OF EXPLOSIVE LEG STRENGTH ON THE REALISATION OF SPECIFIC TASKS IN BASKETBALL

Fatmir Pireva[1], Shemsedin Vehapi[1], Ardita Pireva[2], Besim Gashi[1]

1. Faculty of Physical Education and Sports, AAB College, Prishtina, Kosovo
2. Independent researcher

ABSTRACT

T he study included a total of 85 11-year-olds who attend regular exercises at a basketball school. The sample was treated with 4 basic motor skills tests, and 3 situational basketball motor skills tests. The purpose of the paper is to prove that the system of predictor variables will obtain significant values in predicting the criteria variables.

Keywords: correlations, regression, basketball players

INTRODUCTION

The growing popularity of the basketball game, an increase in the quality of the game, as well as the involvement of a large number of our young people in basketball raise the need to organise work with young people to approach it seriously. The application of new programmes for processing results gives us even more precise information regarding the development of the most complex movements and specifics in the sport of basketball. A large number of authors have addressed topics similar to the one expressed in the present study.Basketball is a physically demanding sport and has developed a hugely competitive nature (Jack, 2017). The sport of basketball requires specific skills that can be completed under dynamic conditions, in most cases while moving at a high speed or while changing directions (Ransone, 2016). In basketball, the ability to generate maximal strength levels in the shortest period of time (muscular power) has been considered as essential to obtain high sport performance levels (Eduardo et al., 2008). To reach the goal, we need to consider the multi-dimensional status of humans as well as the complexity of correlations among dimensions, especially in the research sample, which is at the most critical phase of growth and development. (Pireva, 2015). There have been a number of studies investigating jump performance in a range of players; often with the aim of distinguishing between males and females, those from a range of abilities, and for the purpose of assessing different training interventions (Balciunas et al., 2006; Matavulj et al. 2006) Otherwise, plyometrics is closely related to speed and strength, which is ultimately the result of force. Regarding plyometric exercises, we can consider the possibility of muscles which express the maximum strength for a short time used in basketball (Matavulj, et al., 2003). Explosive strength, take-off power, speed, and agility are abilities that make an important contribution to the efficient movement with and without the ball, thus playing an important role in basketball technique and tactics (Erculj et al., 2010). Physical training is a prerequisite for learning the technique and tactics of the game of basketball and their application in the game. (Iulian Ghițescu et al., 2013). In basketball, the ability to generate maximal strength levels in the shortest period of time (muscular power) has been considered as essential to obtain high sport performance levels.

METHODS

The research included 85 players of the basketball school "PROBASKET" from Prishtina, aged 11. These players are in the final stages of the regular basketball school curriculum for beginners. In order to carry out this research and verify the hypotheses presented, the results are processed with the statistical program SPSS 20.0 and the appropriate methods. Correlation and Regression

Research sample

The sample is included in two spaces: basic motor skills, and situational motor skills.
Basic motor skills variables. 1. MSLJ-Standing long jump 2. MHJ - High jump 3. MR20m - 20 meters running 4. MBTH 1kg - 1kg medicine ball throw
Situational motor skills variables. 1. MR3X10m - 3X10m forward-backward running 2. MSBD- slalom ball dribbling with 5 obstacles in a straight line 3. MSBDZ5- slalom ball dribbling with 5 zigzag obstacles

Hypothesis
H1: Significant correlation values will be obtained between the basic and situational motor tests.

H2: The system of predictor variables will obtain significant values in predicting the criteria variables.

RESULTS AND DISCUSSION

From the results obtained in Table 1, it can be seen that in most cases high statistical values were obtained at the level of 0.01, except for the medicine ball throw test, the standing high jump test and 20m run which are normal.

From the results obtained in Table 1, it can be seen that in most cases high statistical values were obtained at the level of 0.01, except for the medicine ball throw test, the standing high jump test and 20m run which are normal. Table 3 presents the results of the interrelationships between the basic motor and situational variables.

From the obtained values, it can be seen that the variable medicine ball throw with all other variables (except for the variable jump from place to place) presented low statistically insignificant values. While in other variables we have valuable and high statistical values.

Table 1: Correlation coefficients of basic motor variables

	MKVGJ	MKVL	MV20m	MHMB1kg
MSLJ	1			
MHJ	.598**	1		
MR20m	-.658**	-.504**	1	
MBTH 1kg	-.319**	.155	.107	1

** The correlation is valid at the 0.01 (1-star) level.

Table 2: Correlation coefficients of situational motor variables

	MV3x10m	MVSLLD	MSLL5PZZ
MR3X10m	1		
MSBD	.435**	1	
MSBDZ5	.669**	.640**	1

** The correlation is valid at the level of 0.01 (1-star).

Table 3: Correlation of basic motor and situational motor skills

	MR3X10m	MSBD	MSBDZ5	MSLJ	MHJ	MR20m	MBTH 1kg
MR3X10m	1						
MSBD	.435**	1					
MSBDZ5	.669**	.640**	1				
MSLJ	-.644**	-.348**	-.533**	1			
MHJ	-.452**	-.461**	-.497**	.598**	1		
MR20m	.718**	.533**	.557**	-.658**	-.504**	1	
MBTH 1kg	.087	-.172	.109	-.319**	.155	.107	1

REGRESSION ANALYSIS

The regression analysis in this research was conducted to show what the characteristics of the basic and situational motor skills included in the paper are. Namely, to what extent the result in situational mobility tests can be predicted from the results of basic mobility tests.

Consistent with the purpose of the research, regression analysis was applied to show what relationships they have with the basic and situational motor skills included in the research.

At the same time, it was applied in order to determine the impact of basic motor skills as a system of predictors on the level of manifestation and prediction of the result in situational skills characteristic of the game of basketball.

The first tables present the main elements of regression analysis such as: multiple correlation (R) which represents the value of the correlation between all predictor variables and the criterion variable, adjusted coefficient (Adjusted R square) which represents the percentage of common variance between predictor variables and criterion variable and validity (Sig F change), representing statistical validity at the level of reliability .01.

Table 4: Influence of predictor variables on the criterion variable 3x10m Run

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.757(a)	.573	.539	.43420	.573	16.791	4	50	.000

a Predictors: (Constant), MBTH 1kg, MR20m, MHJ, MSLJ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.663	4	3.166	16.791	**.000**(a)
	Residual	9.427	50	.189		
	Total	22.089	54			

a Predictors: (Constant), MBTH 1kg, MR20m, MHJ, MSLJ
b Dependent Variable: MR3X10m

Coefficients (a)

Model		Unstandardised Coefficients		Standardised Coefficients	t	**Sig.**	Correlations		
		B	Std. Error	**Beta**			Zero-order	Partial	Part
1	(Constant)	7.331	1.593		4.601	.000			
	MSLJ	-.011	.005	-.354	-2.299	**.026**	-.644	-.309	-.212
	MHJ	.003	.013	.029	.225	.823	-.452	.032	.021
	MR20m	1.023	.251	.509	4.072	**.000**	.718	.499	.376
	MBTH 1kg	.000	.000	-.085	-.774	.442	.087	-.109	-.072

a Dependent Variable: MR3X10m

Based on the values obtained in the above tables, it can be concluded that the system of basic motor variables included in the research serves as an important predictor in the realisation of the test 3x10 meters run. This conclusion is based on the significant value of F = 16.80 which is significant at the level 0.00. The magnitude of the multiple correlation is R = .757, while the delta value is Delta = .539 which means that 54% of the common predictor and criterion variability is explained.

In Table No. 4 which presents the values of beta coefficients and partial correlations of each variable with the criterion, we notice that only the variables Standing long jump and 20 meters run have shown significant values in predicting the result in the criterion variable. This can be justified by the high connection of explosive force and speed of the legs with the results achieved in situational running in basketball.

Table 5: The influence of basic motor skills on the criterion variable Slalom running

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.606(a)	.367	.316	.31649	.367	7.250	4	50	.000

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.905	4	.726	7.250	.000(a)
	Residual	5.008	50	.100		
	Total	7.913	54			

a Predictors: (Constant), MBTH 1kg, MR20m, MHJ, MSLJ
b Dependent Variable: MSBD

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	1.544	1.162		1.329	.190			
	MSLJ	.001	.004	.028	.148	.883	-.348	.021	.017
	MHJ	-.013	.010	-.217	-1.365	.178	-.461	-.189	-.154
	MR20m	.555	.183	.461	3.029	.004	.533	.394	.341
	MBTH 1kg	.000	.000	-.179	-1.339	.187	-.172	-.186	-.151

Based on the values obtained in the above tables, it can be concluded that the system of basic motor variables included in the research represents an important predictor in the realisation of the test slalom ball dribbling with 5 obstacles in a straight line. We support this conclusion with the significant value of F = 7.25 which is significant at the level of 0.00. The magnitude of the multiple correlation is R = .606, while the delta value is Delta = .316 which means that 32% of the common predictor and criterion variability is explained. In Table No. 3 which presents the values of beta coefficients and partial correlations of each variable with the criterion, we notice that only the variables standing long jump and medicine ball throw have shown significant values in predicting the result in the criterion variable.

This can be justified by the high connection of explosive force and speed of the legs with the results achieved in situational running in basketball.

Table 6: The influence of basic motor skills on the zigzag slalom ball dribbling tes

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.627(a)	.393	.345	.35998	.393	8.104	4	50	.000

a Predictors: (Constant), MBTH 1kg, MR20m, MHJ, MSLJ

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.201	4	1.050	8.104	.000(a)
	Residual	6.479	50	.130		
	Total	10.680	54			

a Predictors: (Constant), MBTH 1kg, MR20m, MHJ, MSLJ
b Dependent Variable: MSBDZ5

Coefficients (a)

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	4.177	1.321		3.161	.003			
	MSLJ	-.003	.004	-.143	-.777	.441	-.533	-.109	-.086
	MHJ	-.018	.011	-.259	-1.661	.103	-.497	-.229	-.183
	MR20m	.455	.208	.325	2.182	**.034**	.557	.295	.240
	MBTH 1kg	.000	.000	.069	.527	.600	.109	.074	.058

a Dependent Variable: MSBDZ5

Based on the values obtained in the above tables, it can be concluded that the system of basic motor variables included in the research serves as an important predictor in the realisation of the test 3x10 meters run. We support this conclusion with the significant value of F = 16.80 which is significant at the level of 0.00. The magnitude of the multiple correlation is R = .757, while the delta value is Delta = .539 which means that 54% of the common predictor and criterion variability is explained.

In Table No. 3 which presents the values of beta coefficients and partial correlations of each variable with the criterion, we notice that only the variables standing long jump and 20 metres run have shown significant values in predicting the result in the criterion variable. This can be justified by the high connection of explosive force and speed of the legs with the results achieved in situational running in basketball.

CONCLUSION

The value of the research lies in the possibility of applying the knowledge gained in the process related to the selection and orientation of young talents in basketball.

This paper also provides assistance in the continuation of numerous efforts to find the most effective modalities of kinesiological treatments, as well as to better understand the magnitude of the impact various factors have in the rise and formation of quality basketball players. All these are important, especially when we are dealing with athletes of a young age and taking into account the ever-increasing level of basketball in the Kosovo area. We can conclude that, based on the achieved results, the hypotheses have been verified: The first H1 hypothesis has been fully realised because important correlation values have been obtained between the basic and situational motor tests.

The second H2 hypothesis has been validated because the predictor system has realised significant values in predicting the variable criteria. Explosive force ability is the most important special quality of basketball players. It is closely linked with the explosive force and is one of the aims of the training. The player jumps to shoot, jumps to intercept the ball and jumps to recover it. It is known that the team which controls the recoveries wins the game, because their attacks multiply and minimise those of the opponent (Iulian Gabriel Ghițescua, Virgil Tudora, Alina Daniela Moanță 2013).

REFERENCES

1. Balciunas, M, Stonkus, S, Abrantes, C., Sampaio, J. (2006). Long-term effects of different training modalities on power, speed, skill and anaerobic capacity in young male basketball players. Journal of sports science and medicine, 5: 163–170.

2. Matavulj D., Mkukolj, D. Ugarkovic, J. Tihanyi (2003). Effects on plyometric training on jumping performance in junior basketball players. The journal of strength and conditioning research 17(4):704-709.

3. Eduardo J. A. M. Santos and Manuel A. A. S. Janeira, (2008) Effects of complex training on explosive strength in adolescent male basketball players. Journal of strength and conditioning research the tm | www.nsca-jscr.org

4. Erculj F., Blas M., Bracic M. (2010). Physical demands on young elite European female basketball players with special reference to speed, agility, explosive strength, and take-off power. J strength cond res; 24(11): 2970-2978,

1. Fatmir Pireva, Shemsedin Vehapi, Branimir Mikić, Ardita Pireva, Besim Gashi. (2015). Differences in motoric and anthropometric space between 12-year old boy basketball players and students. Sport science 8 (2015) 2. Http://www.sportscience.ba/pdf/br16.pdf

2. Jack Ransone (2016). Physiologic profile of basketball athletes. Sports Science Exchange Vol. 28, no. 163, 1-4

3. Jack Ransone, P. A. (5th February 2017). Physiologic profile of basketball athletes. Physiologic profile of basketball athletes, pp. 5-9.

4. Iulian Gabriel Ghițescua, Virgil Tudora, Alina Daniela Moanță̆a (2013). Study on the development of vertical jumping force in U18 junior basketball players. National University of Physical Education and Sport, 140 Constantin Noica str., Bucharest, 060057, Romania.

5. Dr. William A. Sands | Jacob J. Wurth | Dr. Jennifer K. Hewit (2012). Basics of Strength and Conditioning Manual. National Strength and Conditioning Association.

UTICAJ EKSPLOZIVNE SNAGE NOGU NA IZVEDBU POSEBNIH ZADATAKA U KOŠARCI

S tudija je obuhvatila ukupno 85 jedanaestogodišnjaka koji pohađaju redovne treninge u školi košarke. Uzorak je obrađen korištenjem 4 testa osnovnih motoričkih sposobnosti i 3 testa situacijskih motoričkih sposobnosti u košarci. Svrha rada je dokazati da će sistem prediktivnih varijabli ostvariti značajne vrijednosti u predviđanju kriterijskih varijabli.

Ključne riječi: korelacije, regresija, košarkaši

Correspondence to: Shemsedin Vehapi
Faculty of Physical Education and Sports, AAB College, Prishtina, Kosovo
E-mail: shemsedin.vehapi@aab-edu.net