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Original scientific paper

REGRESSION ANALYSIS RESULTS OF VARIABLES FOR MOTOR SKILLS ASSESSMENT AND SPECIFIC MOTOR VARIABLES IN INITIAL MEASUREMENT OF 16 AND 17 YEARS OLD BASKETBALL PLAYERS

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Abstract

A sample with 108 members was realized with 16 and 17 years old female basketball players, members of the youth schools of FBC "Struga 2009", FBC "Krosig" Skopje, and FBC "Bashkimi" Prizren, to determine the effects of sixteen-week practice process for developing explosive strength of the lower limbs. The sample was composed of three groups, realized by 36 female basketball players. The research applied a total of six (6) variables for the assessment of the specific motor skills: Movement in back space in basketball position /BSBP/, Movement in defensive basketball stance 6x4m /MDB6X4/, Vertical jump on a ball that hangs for 10 sec /VJ10S/, Rejecting the ball from the board jump in with both hands/RBJBH/, Test breakthrough of the laying basket for 30 sec /TBL30/, Kamikaze ball /KB/. Based on the results obtained we came to a conclusion that both experimental models applied improve explosive power of the lower limbs. The first experimental model causes significant positive changes and is more efficient than the second one. Both models can be realized by 16 and 17 year old female basketball players. The survey has a theoretical and practical importance especially in the area of program applications, sport and sport science. According to the results of regression analysis of variables for motor skills assessment and specific motor variables in initial measurement, it can be noticed that different predictor variables have statistically significant impacts on each criterion variable. Therefore, more attention should be paid to the development of motor skills during the training process.

Keywords: experimental program, explosive power, regression analysis, motor skills, specific motor abilities.

1. Introduction

The main purpose of this research is to find the important elements for achieving success in basketball. Physical preparation (explosive power of lower extremities) of the basketball players in the final decade is becoming more and more important as the contemporary basketball game requires maximal prepared players. There has been made an effort through testing of some motor characteristics in 3 female teams in order to get relevant data about the success in basketball. The methods of explosive power development (plyometric - isometric) are being successfully adopted for many years in the technology of sport preparation in all types of sport. Numerous studies have verified that this game requires a high psychophysical training, where it's all about the general and specific morphological characteristics, mechanical and functional capacity etc. (Jukić, Nakić & Milanović 2003). It has also been verified that the level of proportion

between these specific motor abilities has a direct impact in the successful scoring of the game and achieving high success in it (Blaśković & Hofman, 1984; Pasalić, Rađo & Brdaić, 2004). Pavlović (1983) has given equation specifications success playing basketball, which contains and explains the share of each factor in the result of basketball. Such trainings, despite the fact that affect the muscle quality, also increase the importance of the results of the main skills, such as muscle stiffness. In this research it is noticed that the young basketball players, when under the influence of the programmed training process, usually achieve better results in the final measurement rather than in the initial one. This research gives answer to the following questions and dilemmas: where should the plyometric training be placed in the training programme, which exercises are more efficient for basketball players, how long it is necessary to train, with what workload intensity and in which period of training process should the analysed experimental program be applied.

2. Material & methods

The examinees were young basketball players aged 16 and 17, who had been trained at least 4 years. The examinees in question are members of the following young schools of basketball clubs: “FBC Struga 2009” from Struga, "FBC Krosig” from Skopje, “FBC Bashkimi” from Prizren. This model of research in total includes 108 examinees that were divided in 3 sub-models, with 36 examinees in each of them. The first experimental group E-1 realized 16 week-experimental program for improvement of the explosive power of lower extremities with plyometric training in FBC “Struga 2009” from Struga. The second experimental group E-2 realized 16-week experimental program for improvement of the explosive power of lower extremities with exercises of general character for development of the explosive power called “Chess table” in FBC “Krosig” from Skopje. Control group K-1 realized technical-tactical elements as provided with the trainer program of the club FBC “Bashkimi” from Prizren. During this research there were executed two measurements: initial and final measurement. The research applied a total of six (6) variables for the assessment of the specific motor skills: movement in back space in basketball position /BSBP/; movement in a defensive basketball position 6x4m /MDB6X4/; vertical jump on a ball that hangs for 10 sec /VJ10S/; rejection of the ball from the board in a jump with both hands /RBJBH/; dribble penetration to the basket and shooting for 30 sec /DPSH30/; kamikaze ball /KB/.The research applied a total of six (6) variables for the assessment of the general motor skills: standing long jump (SLJ); high jump (HJ); running 20m from standing start (R20MSS); agility test 4x10 m (AT4x10M); T-Test (TT); zigzag movement in defense zone (ZZMDZ).

3. Results and discussion

According to the results of regression analysis of variables for motor skills assessment and specific motor variables in initial measurement, it could be concluded that the general motor variables do not have a statistical impact on specific motor variables in the initial measurement. First experimental sample causes significant positive changes and is more efficient than the second and third experimental sample. The criterion variables in this research are: BSBP (movement in back space in basketball position) variable, in the initial measurement at the first sub-model examinees. MDB6X4 (movement in a defensive basketball position 6x4m) variable,

in the initial measurement at the first sub-model examinees. RBJBH (rejection of the ball from the board in a jump with both hands) variable, in the initial measurement at the first sub-model examinees. DPSH30 (dribble penetration to the basket and shooting for 30 sec) variable, in the initial measurement at the second sub-model examinees. BSBP (movement in back space in basketball position) variable, in the initial measurement at the third sub-model examinees. VJ10S (vertical jump on a ball that hangs for 10 sec) variable, in the initial measurement at the third sub-model examinees.

The predictors' variables in this research are: SLJ-standing long jump; HJ- high jump; R20MSS-running 20m from standing start; AT4x10M- agility test 4x10 m; TT- T-Test; ZZMDZ- zigzag movement in defense zone.

In the initial measurement at the first sub-model examinees, the system of predictive motor variables has a statistically significant impact on specific motor variables: BSBP (movement in back space in basketball position), MDB6X4 (movement in a defensive basketball position 6x4m) and RBJBH (rejection of the ball from the board in a jump with both hands).

Table 1. Regression analysis of BSBP (movement in back space in basketball position) variable, in the initial measurement at the first sub-model examinees.

		St. Err.			
	BETA	of BETA	Part. corel.	t(23)	p-level
SLJ	.003907	.222687	.003658	.017545	.986153
HJ	-.203709	.228086	-.183081	-.893124	.381041
R20MSS	.324914	.217896	.296904	1.491140	.149513
AT4x10M	-.161208	.265437	-.125633	-.607328	.549583
T-TEST	.011166	.175790	.013244	.063522	.949900
ZZMDZ	.418660	.210616	.382896	1.987789	.058867

RO=.64712 Δ= .41877 F=2.7619 Q(F)<.03592

SLJ-standing long jump; HJ- high jump; R20MSS- running 20m from standing start; AT4x10M- agility test 4x10 m; TT- T-Test; ZZMDZ- zigzag movement in defense zone.

In table 1, the results show that the system of predictor variables have a statistically significant impact on the criterion variable, which is noticed from the value of Q(F)<03592BSBP (movement in back space in basketball position), and level of significance p<.05. The value of the multiple correlation is RO = .64712, and the coefficient of determination Δ= .41877.

Table 2. Regression analysis of MDB6X4 (movement in a defensive basketball position 6x4m) variable, in the initial measurement at the first sub-model examinees.

		St. Err.			
	BETA	of BETA	Part. corel.	t(23)	p-level
SLJ	-.077064	.189418	-.084530	-.40685	.687880
HJ	-.215226	.194010	-.225366	-1.10936	.278742
R20MSS	.421112	.185343	.428142	2.27207	.032749
AT4x10M	.115967	.225782	.106489	.51363	.612413
T-TEST	.170260	.149527	.231004	1.13865	.266569
ZZMDZ	-.036469	.179150	-.042408	-.20357	.840483

RO=.76122 Δ= .57946 F=5.2821 Q(F)<.0015

SLJ-standing long jump; HJ- high jump; R20MSS- running 20m from standing start; AT4x10M- agility test 4x10 m; TT- T-Test; ZZMDZ- zigzag movement in defense zone.

In table 2, the results show that the system of predictor variables have a statistically significant impact on the criterion variable, which is noticed from the value of Q(F)<.0015, and level of

significance p<.05. The value of the multiple correlation is RO =.76122, and the coefficient of determination Δ=.57946 indicates 58% of the variance of the criterion variable.

Table 3. Regression analysis of RBJBH (rejection of the ball from the board in a jump with both hands) variable, in the initial measurement at the first sub-model examinees.

		St. Err.			
	BETA	of BETA	Part. corel.	t(23)	p-level
SLJ	.445300	.216345	.394394	2.05829	.051066
HJ	-.643090	.221590	-.517728	-2.90217	.008031
R20MSS	-.031930	.211690	-.031436	-.15083	.881422
AT4x10M	-.113279	.257878	-.091213	-.43927	.664562
T-TEST	.075124	.170783	.091338	.43988	.664131
ZZMDZ	.459436	.204618	.424015	2.24534	.034655
	RO=.67186	**Δ= .45140**	**F=3.1542**	**Q(F)<.0209**	

SLJ-standing long jump; HJ- high jump; R20MSS- running 20m from standing start; AT4x10M- agility test 4x10 m; TT- T-Test; ZZMDZ- zigzag movement in defense zone.

In table 3, the results show that the system of predictor variables have a statistically significant impact on the criterion variable, which is noticed from the value of Q(F)<.0209, and level of significance p<.05. The value of the multiple correlation is RO =.67186, and the coefficient of determination Δ=.45140.

In the initial measurement at the second sub-model examinees, the system of predictive motor variables has a statistically significant impact only on the specific motor variable DPSH30 (dribble penetration to the basket and shooting for 30 sec).

Table 4. Regression analysis of DPSH30 (dribble penetration to the basket and shooting for 30 sec) variable, in the initial measurement at the second sub-model examinees.

		St. Err.			
	BETA	of BETA	Part. corel.	t(23)	p-level
SLJ	-.249072	.190603	-.262893	-1.30676	.204211
HJ	.259009	.198337	.262733	1.30590	.204497
R20MSS	-.729488	.246018	-.525885	-2.96518	.006934
AT4x10M	.024468	.293478	.017382	.08337	.934277
T-TEST	-.024025	.258440	-.019380	-.09296	.926738
ZZMDZ	.222267	.223467	.203074	.99463	.330265
	RO=.64338	**Δ=.41394**	**F=2.7076**	**Q(F)<.03876**	

SLJ-standing long jump; HJ- high jump; R20MSS- running 20m from standing start; AT4x10M- agility test 4x10 m; TT- T-Test; ZZMDZ- zigzag movement in defense zone.

In table 4, the results show that the system of predictor variables have a statistically significant impact on the criterion variable, which is noticed from the value of Q(F)<.03876, and level of significance p<.05. The value of the multiple correlation is RO =.64338, and the coefficient of determination Δ=.41394.

In the initial measurement at the third sub-model examinees, the system of predictive motor variables has a statistically significant impact on specific motor variables: BSBP (movement in back space in basketball position) and VJ10S (vertical jump on a ball that hangs for 10 sec).

Table 5. Regression analysis of BSBP (movement in back space in basketball position) variable, in the initial measurement at the third sub-model examinees.

		St. Err.			
	BETA	of BETA	Part. corel.	t(23)	p-level
SLJ	.167705	.190955	.180131	.878244	.388894
HJ	-.084906	.157573	-.111653	-.538839	.595176
R20MSS	.127055	.185241	.141577	.685888	.499640
AT4x10M	-.007243	.217397	-.006947	-.033319	.973708
T-TEST	.415065	.166206	.461857	2.497296	.020114
ZZMDZ	.522722	.172226	.534766	3.035088	.005884
	RO=.77431	**Δ=.59955**	**F=5.7394**	**Q(F)<.00091**	

SLJ-standing long jump; HJ- high jump; R20MSS- running 20m from standing start; AT4x10M- agility test 4x10 m; TT- T-Test; ZZMDZ- zigzag movement in defense zone.

In table 5, the results show that the system of predictor variables have a statistically significant impact on the criterion variable, which is noticed from the value of Q(F)<.00091, and level of significance p<.05. The value of the multiple correlation is RO =.77431, and the coefficient of determination Δ=.59955.

Table 6. Regression analysis of VJ10S (vertical jump on a ball that hangs for 10 sec) variable, in the initial measurement at the third sub-model examinees.

		St. Err.			
	BETA	of BETA	Part. corel.	t(23)	p-level
SLJ	.628467	.217841	.515478	2.88497	.008358
HJ	.082074	.179759	.094775	.45658	.652255
R20MSS	.311847	.211323	.294095	1.47569	.153587
AT4x10M	-.075264	.248006	-.063153	-.30348	.764254
T-TEST	-.225102	.189607	-.240296	-1.18721	.247264
ZZMDZ	-.108482	.196475	-.114374	-.55214	.586176
	RO=.69199	**Δ=.47885**	**F=3.5323**	**Q(F)<.01278**	

SLJ-standing long jump; HJ- high jump; R20MSS- running 20m from standing start; AT4x10M- agility test 4x10 m; TT- T-Test; ZZMDZ- zigzag movement in defense zone.

In table 6, the results show that the system of predictor variables have a statistically significant impact on the criterion variable, which is noticed from the value of Q (F)<.01278, and level of significance p<.05. The value of the multiple correlation is RO =.69199, and the coefficient of determination Δ=.47885.

4. Conclusion

This research was conducted in order to confirm the effect resulting from the application of two experimental models for the development of explosive power of the lower extremities, lasting 16 weeks. According to the results of regression analysis of variables for motor skills assessment and specific motor variables in initial measurement, it can be noticed that general motor variables do not have a statistical impact on specific motor variables in the initial measurement. Based on the obtained results we may conclude that different predictor variables have statistically significant impacts on each criterion variable. Therefore, more attention should be paid to the development of motor skills during the training process.

In order to achieve excellent result, it is necessary to create and plan the sports training that will enable the athlete to achieve the desired goal in the most optimal way. A group of professionals often participate in the sports training planning where each of them give suggestions and recommendations.

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