

THE INFLUENCE OF SOME MOTOR SKILLS AND ANTHROPOMETRIC CHARACTERISTICS IN SUCCESSFUL SPRINT RUNNING AT 200 METERS AT STUDENTS OF 16 YEARS OLD

(Research note)

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Abstract

In this paperwork, a research have made on the effect of motor skills and anthropometric characteristics in successful sprint running at 200 meters. The aim of this paper was to prove the linkage between the motor skills and anthropometric characteristics as a predictor system with effectiveness and results in running discipline at 200 meters as situational-motor variables of criteria system. The research is made by testing 130 sample 16 years old male, high school students ± 6 months, of the gymnasium "Sami Frasheri"- Kumanovo. There have been used 26 variables in this research. 12 of them are used to evaluate motor skills, 13 for evaluating anthropometric characteristics and 1 of them to evaluate the situational-motor skills. By proving the individual influence of motor skills and anthropometric characteristics in successful sprint running at 200 meters, the results bring a conclusion that: motor variables and those anthropometric used as predictor variables in this paper, have significant statistical impact in criteria variables on 200m running (MTP200m). More affinity showed the variable longwise jumping from the point (MCDM) which expresses the explosive force and correlates more with 200 meters running, from what we can suggest to pedagogues and trainers who train sprint running, to add more exercises that develop sprint running as well as plyometric exercises. Whereas, from the anthropometric variables, a bigger affinity have shown variables like the perimeter of the forearm (AOn) and the variable the perimeter of arm (AOP) which in positive way correlates with the running on 200 meters, which means that in sprint running, a person needs clear muscular mass of upper and low extremities, as it is known that when the muscle is more hypertrophied, shows more force, in our case an explosive force, to have better results in professional aspect.

Keywords: *motor tests, anthropometric measurements, predictor variables criteria variable, physical education, explosive muscle strength, regression analysis*

INTRODUCTION

Athletics is one of basic sports and an essential branch of the Physical Education, as well as running, notably as racing discipline, which dates back from old games, respectively the first Olympic games of 776 B.C., where running in one period (129 meters), was the only run racing discipline. It is known as the Queen of sports because there are several branches and motile disciplines within it. Running, notably in short paths, is part of some studies and investigations because they have a specific variety, notably running in 200 meters as typical sprint running, which is the studying object in this research. The specific thing here is that runners do not run in straight track, because there is a turn immediately at the beginning of the track, so the sprinter should have additional technical skills for a good start and be explosive at the turn and take the turn with a maximum speed.

As been seen from the structural analyze, sprint running is divided into four phases, such as: start, starting acceleration, distance running and finish. All phases are connected with each other toward gaining more effective results. To reach better results in sprint running, the runner needs to have an explosive force and an excellent psychomotor coordination.

For this to be realized, it is needed the use of studying methodology for enforcement of the structure of anthropologic dimensions, their directions and development characteristics as well as the approach of the use of methods and tools for body exercises for reaching an optimal development of children and teenagers. Except this, it is important to determine the value of motor tests and anthropometric measures to follow the situation and changes of latent dimensions which will be realized with tools of body exercises in Physical Education.

In accordance with this, the information for the relation of anthropometric characteristics and motor skills with successful sprint running, are very important for the theory and the practice of Physical Education. This problem will be realized in this paperwork, with high school students of the gymnasium “Sami Frasheri” from Kumanovo.

METHODS

The object of this research are sport skills of students which form on regular classes during the exercises in Physical Education, formed like the model of athletics discipline, running in 200 meters. Besides, the subjects of the research are anthropometric (morphological) characteristics and motor skills of students at the age of 16.

The main problem of the research is to determine the value level and characteristics of the relation of sports success of high school students at running in 200 meters with anthropometric characteristics and anthropometric skills in regular physical education training.

According with the subject and the research problem, the general aim of the research is to confirm the relation between anthropometric characteristics and motor skills (as a predictor system) with an efficient result in athletic running discipline in 200 meters at high school students (criteria system). Within this general aim, the specific aim is to confirm the level of cooperation of anthropometric and motor span with the result of running in 200 meters.

The sample of the research is taken from high school students of gymnasium “Sami Frasheri” from Kumanovo. There are 130 testers, male students.

There have been 26 variables in this research: 12 variables to evaluate motor skills, 13 variables to evaluate anthropometric characteristics and 1 variable to evaluate situational-motor skills.

RESULTS

To demonstrate the relation between motor variables and the anthropometric variables (as a predictor

system), we have used regressive analysis as a method for analyzing the effect and the direction which belongs to multi option analysis.

In the following charts we have shown results from the regressive analysis of the variable criteria running in 200 meters (MTP200 m).

In Table 1., we can see that multiple correlation between criteria variable running in 200 meters (MVR200 m) and all other free variables (predictor) have statistic importance $R = (0,666)$, respectively explains the common variability for about 44,3% ($R^2 = 0,443$), when the other percentage 55,7% of the description of common variable of criteria variable (MTP200 m) belongs to other anthropometric characteristics which are not been researched yet (as other anthropometric, motor, cognitive, and functional variables). From this, we can comment on the results about the effect of predictor index on criteria index running in 200 meters (MTP200 m).

In Table 2., we have described the variance analyze of multiple regression. It is seen in the chart that the value of variability between the groups (regression) is smaller than the value of the variability within the group (residual). The value of F test is 3,308, while the credibility level $p = 0,000$ shows that the variability value between the group and within it at the variance of multiple regression has a difference with statistic significance.

In Table 3., we can see that the impact of predictor variables on criteria variables running in 200 meters (MTP200 m) is calculated according to the beta standardized coefficient value. Of more statistic significance is the variable jumping in length from the point (MCДM) with a negative value of beta standardized coefficient -0,342 and credibility level 0,004, and variable of hand perimeter (AOn) with a value of - 0,380 and a credibility level 0. 054, both with negative signs, which mean that the impact of these variables on the value of running in 200 meters is negative. Also the variable of the arm (AOP) with value 0.434 and statistic significance of credibility level 0,018, has a statistic importance but

Table 1. Regression of variable MTP200m

Model summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
,666(a)	,443	,309	3,89978

Table 2. Values of the parameters of the analysis of variance –MTP200M ANOVA(b)

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	1257,898	25	50,316	3,308	,000
Residual	1581,662	104	15,208		
Total	2839,560	129			

Table 3. Regression analysis of variable MTP200m

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std.error	Beta		
(Constant)	74,095	19,427		3,814	,000
AVIS	,007	,144	,010	,052	,959
ASVIS	-,005	,107	-,004	-,044	,965
AND	,075	,156	,082	,481	,631
AsP	-,157	,269	-,071	-,583	,561
AsK	-,086	,169	-,055	-,511	,610
Asp	,148	,296	,059	,499	,619
ATEZ	,035	,092	,097	,374	,709
AOGK	-,077	,132	-,131	-,583	,561
AOP	,621	,258	,434	2,404	,018
Aop	-,803	,411	-,380	-1,953	,054
AKDR	,157	,171	,111	,920	,360
AKDG	,314	,223	,208	1,410	,162
AKDS	-,147	,166	-,138	-,889	,376
MRp	-,245	,299	-,078	-,819	,415
MTN	-,255	,177	-,146	-1,439	,153
MTR	-,028	,107	-,025	-,266	,791
MDp	,043	,056	,068	,764	,446
MS	-,037	,034	-,101	-1,078	,283
MpB	-,023	,042	-,046	-,551	,583
MTM	-,006	,011	-,065	-,517	,607
MpM	-,003	,007	-,049	-,381	,704
MSDM	-,074	,025	-,342	-2,945	,004
MIZ	-,008	,020	-,038	-,398	,691
MGM	-,158	,174	-,087	-,907	,367
MMp	-,027	,076	-,032	-,357	,722

with a positive sign. The value of this parameter shows us a positive impact of the arm perimeter on the value of the time of realization of the test running in 200 meters, which means that if students have fat upper extremities, they run slowly in the given distance, while if they have clear muscular mass of upper and lower extremities, they will realize running in 200 meters faster. Other beta standardized coefficient values are not of much statistic importance and we will not stop to comment about them.

CONCLUSION

Based on the results and analysis, we can come to a conclusion that:

Motor variables and those anthropometric used as predictor variables in this paperwork, have a significant impact on criteria variable running in 200 meters (MTP200 m). The variable jumping in length from the point (MCDM) has shown bigger interest from motor variables, which expresses explosive force and correlates more with running in 200 meters. Therefore, we can suggest professors and trainers, who are engaged with sprint running, to use more exercises, which develop

the explosive force and the speed, notably polymeric exercises. Whereas variables like hand perimeter (AOp) and variable arm perimeter (AOP) from anthropometric variables have shown bigger relation, which correlate positively with running in 200 meter, what means that in sprint running it is needed a clear muscular mass of upper and lower extremities as it is known that if the muscle is more hypertrophied, it shows bigger force, in our case an explosive force, for better results in professional aspect.

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