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PREDICTOR VALUES OF ANTHROPOMETRIC CHARACTERISTICS IN RUNNING SHORT DISTANCE ON THE YOUNG ATHLETES

1. INSTRUCTION

Priceless is important for optimal growth and development, and the health of any person, to monitor and evaluate the features and capabilities of man (Findak., 1996). Teaching physical education in schools is carried out under identical conditions in terms of material conditions. Today, children have greater opportunities for involvement in various forms of organized programmed exercise. The fact is that there are a large number of papers that have investigated the influence of anthropometric characteristics on motor skills (Kurelić N. et al. (1975). They are given certain results, which show the dependence of the results of motor tests, anthropometric characteristics. The basic premise of this research is that on the basis of some anthropometric characteristics can predict the capability of speed running of young athletes aged 15-16 old years, and that the system will predictor measures have a significant impact on the speed running at 20 meters, 40 meters and 60 meters .

2. PROBLEM AND OBJECTIVES OF RESEARCH

This research is aimed at detecting the influence of the size of anthropometrical characteristics at running at 20 meters, 40 meters, and running at 60 meters, with young athletes aged 15-16 old years in Prizren. The main objective of this study was to determine the influence of some anthropometrical characteristics of the running speed of 20 meters, 40 meters and 60 meters.

2.1. Research hypotheses:

Based on the research subject and objectives set by the following hypothesis:

- H1 - There will be no statistically significant effect antropometrisih characteristics as a predictor variable at the criterion system to run at 20 meters,
- H2 - There will be no statistically significant effect antropometrisih characteristics as a predictor variable criterion system to run at 40 meters,
- H3 - There will be no statistically significant effect antropometrisih characteristics as a predictor variable criterion system to run at 60 meters,

3. RESERCH METHODS

3.1. The sample of Entities

The sample of entities is composed of 65 young athletes *of these (30 involved in the sport of table tennis and 35 involved in the tennis sport)* aged 15-16 old years, *in* Prizren. The basic criterion for testing is:

- to be regular during the academic year at physical education classes

- previously not being ill and
- not having physical or physiological deformations.

3.2. The sample of variables

The variables used to measure the anthropometric construction were taken from the International Biological System, while the motor from the standardized tests, they are:

3.2.1. Antropometric (predictor) variables

1. Body height (BOHE)
2. Width elbiow (WIEL)
3. Width knee (WIKN)
4. Body mass (BOMA)
5. Perimeter of sternum (PEST)
6. Perimeter of upper arm (PEUA)
7. Perimeter of the thigh (PETH)

3.2.2. Motoric (kriterion) variables

1. Running at 20 metara (R20M)
2. Running at 40 metara (R40M)
3. Running at 60 metara (R60M)

3.3. Result processing method

Taking into account all these parameters, for the purpose of this research were selected the actions that mostly fit the nature of the research problem. The research results were first processed with the common actions which provide basic information for basic statistical parameters. The results obtained by the methods mentioned above, enable us better knowledge on morphological and motor area regarding the examined students. On the basis of these criteria, for each variable are calculated basic statistical parameters as follows: Mean - arithmetical mean, Min - minimum score, Max - maximum score, Std.Dev. - standard deviation, Skew - distribution symmetry, Kurt - distribution extent, Coefficient of correlation according to Pearson, and hypothesis testing on the validity of rat the level 0.05 of security levels. The results of statistical processing are presented in tables, which enable us the scientific and logical interpretation of the problem. Because of the relief of the exertion, in the paper are used coded symbols or abbreviations. In the further procedure for processing the data with regressive analysis will be analyzed the impact of anthropometric and motor predictors in athletic disciplines as a criterion. Inside the regressive analysis is calculated: Correlation between predicting and criterion variables (R), Determination coefficient (DELTA), Multiple correlations (R), Partial correlations (Part-R), Beta coefficient (BETA).

4. RESULTS AND DISCUSSION

Table 1. *Basic parameters and distribution of variables*

		N	Min	Max	Mean	DS	Skew	Kurt
1.	BOHE	65	145.00	186.00	170.2462	8.91984	-.352	-.115
2.	BOMA	65	38.50	95.00	60.3369	12.11580	.688	.831
3.	WIEL	65	7.30	11.60	8.8277	.84345	1.241	2.118
4.	WIKN	65	9.40	14.30	11.3231	1.21112	.718	-.143
5.	PEST	65	67.00	106.00	84.4692	8.50224	.111	-.168
6.	PEUA	65	18.50	37.00	25.3769	3.11377	.527	2.044
7.	PETH	65	40.00	64.00	50.4231	6.38188	.631	-.278
8.	R20M	65	3.06	4.65	3.6902	.30512	.965	1.816
9.	R40M	65	5.61	9.32	6.6086	.71206	1.758	4.828
10.	R60M	65	8.14	14.32	9.4683	1.17384	2.309	7.381

The results show that the average value of body height is 170.25 cm, while the average body weight is 60.34 kg. According to the minimum and maximum results of these two variables can be said that this group of the examinees does represent a homogeneous group of young athletes. Athletes are finished the 20 meters running for an average time of 3.69 seconds, the 40 meters running for an average time of 6.60 seconds, and the 60 meters running for an average time of 9.46 seconds, the only the anthropometric variable width elbiow (WIEL) and the criterion variable of the 60 meters running, did not show normal distribution.

Table 2. *Cross Correlations variables:*

		MV20M	MV40M	MV60M
1.	BOHE	**-.322****	**-.378****	-.**345****
2.	BOMA	-.186	**-.279***	-.174
3.	WIEL	-.148	-.172	-.109
4.	WIKN	-.196	-.224	-.138
5.	PEST	**-.246***	**-.347****	**-.247***
6.	PEUA	-.119	**-.247***	-.139
7.	PETH	-.051	-.209	-.082

All anthropometric variables the have relations between themselves. In the motor area, the variables of running 20 meters, running 40 meters, and running 60 meters, have shown important relation with the tests of body height (BOHE), body mass (BOMA), perimeter of sternum (PEST), and perimeter of upper arm (PEUA). Regarding students' sample, the relations between the two spaces are smaller. From 21 possible correlations there are only seven significant correlations. Relation is mostly

realized at the variables, body height and perimeter of sternum with criterion variables of running 20 meters, running 40 meters, and running 60 meters.

Regression analysis of criterion variable (R20M) with system of predictor variables (anthropometric measurements).

Table 3. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.474	.225	.129	.28471

Table 4. ANOVA(b)

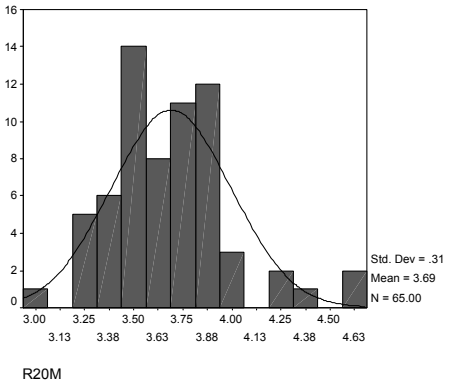
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.338	7	.191	2.358	**.034**
	Residual	4.620	57	.081		
	Total	5.958	64			

Table 5. Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.869	1.345		5.851	.000
	BOHE	-.019	.006	-.547	-3.139	**.003**
	BOMA	.023	.012	.908	1.831	.072
	WIEL	.080	.116	.220	.685	.496
	WIKN	-.185	.073	-.733	-2.518	.015
	PEST	-.018	.009	-.514	-2.030	**.047**
	PEUA	-.007	.024	-.067	-.268	.790
	PETH	.015	.010	.307	1.450	.152

a) Dependent Variable: R20M

Keeping an eye on table 3-5, we see that the connection of the whole system anthropometrical characteristics of the motor test, a speed running to 20 meters (R20M), a multiple correlation coefficient is equal to Ro=.474, which explains the common variance between the system and the criterion variable, with about 23% (Delta= .23). The remaining 77% of the total variability in the explanation of the test motor running test at 20 meters (R20M), can



be attributed to other characteristics and abilities of participants, but which are not taken in this research (anthropometrical characteristics, motor, cognitive, conative, functional, etc.), and conditions during testing, etc. the system anthropometrical variables showed significant correlations with the criteria variable (R20M), which is significant Sig.=.034, and partial correlation with the criteria variable at the level of significance ($p<0.05$), also showed anthropometrical variables (BOHE) significant with the Sig.=.003, and anthropometrical variables (PEST) significant with the Sig.=.047.

4.2. Regression analysis of criterion variables (R40M) with system of predictor variables (anthropometric measurements).

Table 6. ***Model Summary***

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.505	.255	.164	.65113

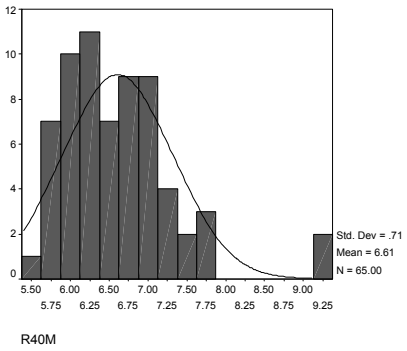
Table 7. ***ANOVA (b)***

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.283	7	1.183	2.791	**.014**
	Residual	24.166	57	.424		
	Total	32.450	64			

Table 8. ***Coefficients(a)***

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.571	3.076		4.737	.000
	BOHE	-.038	.014	-.479	-2.804	**.007**
	BOMA	.025	.029	.420	.865	.391
	WIEL	.410	.266	.485	1.543	.128
	WIKN	-.292	.168	-.496	-1.739	.088
	PEST	-.043	.021	-.517	-2.086	**.041**
	PEUA	.007	.056	.029	.121	.904
	PETH	.005	.023	.041	.199	.843

a) Dependent Variable: R40M



Keeping an eye on table 6-8, we see that the connection of the whole system anthropometrical characteristics of the motor test, a speed running to 40 meters (R40M), a multiple correlation coefficient is equal to Ro=.505, which explains the common variance between the system and the criterion variable, with about 26% (Delta=.26). The remaining 74% of the total variability in the explanation of the test motor running test at 40 meters (R40M), can be attributed to other characteristics and abilities of participants, but which are not taken in this research (anthropometrical characteristics, motor, cognitive, conative, functional, etc.), and conditions during testing, etc. the system anthropometrical variables showed significant correlations with the criteria variable (R40M), which is significant Sig.=.014, and partial correlation with the criteria variable at the level of significance ($p<0.05$), also showed anthropometrical variables (BOHE) significant with the Sig.=.007, and anthropometrical variables (PEST) significant with the Sig.=.041.

4.3. Regression analysis of criterion variables (R60M) with system of predictor variables (anthropometric measurements).

Table 9. ***Model Summary***

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.479	.230	.135	1.09155

Table 10. ***ANOVA(b)***

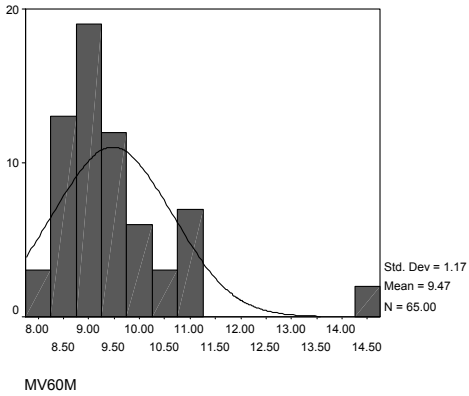
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.271	7	2.896	2.430	**.030**
	Residual	67.915	57	1.191		
	Total	88.186	64			

Table 11. ***Coefficients(a)***

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	25.466	5.156		4.939	.000
	BOHE	-.075	.023	-.570	-3.280	**.002**
	BOMA	.083	.048	.853	1.727	.090
	WIEL	.367	.445	.264	.824	.413
	WIKN	-.536	.281	-.553	-1.905	.062
	PEST	-.080	.035	-.583	-2.312	**.024**
	PEUA	-.019	.093	-.050	-.201	.842
	PETH	.037	.039	.203	.960	.341

a) Dependent Variable: R60M

Keeping an eye on table 9-11, we see that the connection of the whole system anthropometrical characteristics of the motor test, a speed running to 60 meters (R40M), a multiple correlation coefficient is equal to Ro=.479, which explains the common variance between the system and the criterion variable, with about 23% (Delta=.23). The remaining 77% of the total variability in the explanation of the test motor running test at 60 meters (R60M), can be attributed to other characteristics and abilities of participants, but which are not taken in this research (anthropometrical characteristics, motor, cognitive, conative, functional, etc.), and conditions during testing, etc. the system anthropometrical variables showed significant correlations with the criteria variable (R60M), which is significant Sig.=.030, and partial correlation with the criteria variable at the level of significance ($p<0.05$), also showed anthropometrical variables (BOHE) significant with the Sig.=.002, and anthropometrical variables (PEST) significant with the Sig.=.024.



5. CONCLUSION

Based on the results of this study we can conclude the following: anthropometrical characteristics of the predictor variables in the system, significantly affect the speed running at 20 meters, significantly influence the manifestation of running at 40 meters and significantly influence the manifestation of running at 60 meters, as a criterion variables, on the young athletes aged 15-16 old years. This posted hypothesis are completely determined. Based on these correlations, the share of anthropometrical characteristics in explaining the criterion variables are large, so the assumptions of this study

can be accepted. Anthropometrical characteristics of the predictor variables in the system, significantly affect the results of the motoric abilities test, running at 20 meters, running at 40 meters and running at 60 meters, as the criterion variable. In regression analyzes of the motoric abilities test, running at 20 meters, running at 40 meters and running at 60 meters, as the criterion variable, highlighted a statistically significant multiple correlation criterion has been applied to the system of predictor variables. This been confirmed that the applied system of predictor variables significantly associated with outcomes that are achieved in subjects performing the motoric abilities test, running at 20 meters, running at 40 meters and running at 60 meters, in the form of certain motoric abilities. The applied system anthropometrical variables in this study with according the results, are good prediction indicators for the speed running on the 20, 40 and 60 meters. Based on these results, the system of predictor variables, anthropometrical variables of body height (BOHE), and perimeter of sternum (PEST), which is characterized by longitudinal and circular dimensionality, better predict the results of the tests applied to running 20 meters, 40 meters and 60 meters. Specifically, students with higher growth and developed chest will have better results in the sprint disciplines running at 20 meters, 40 meters and 60 meters.

6. LITERATURE

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PREDICTOR VALUES OF ANTHROPOMETRIC CHARACTERISTICS IN RUNNING SHORT DISTANCE ON THE YOUNG ATHLETES

In order to investigate the influence of some anthropometrical characteristics of the event, running speed at 20 meters, 40 meters and 60 meters, an experimental study on a sample of 65 young athletes of these (30 involved in the sport of table tennis and 35

involved in the tennis sport) aged 15-16 years, in Prizren. For purposes of this study were applied 7 tests of anthropometric characteristics that made the predictor variables of the system and the 3 test of motoric abilities that made the criterion variables of the system. Data were analyzed using descriptive and regression analyzes. Based on research results and discussions can be confidently concluded that criterion test (running at 20 meters, 40 meters, and 60 meters), have a significant impact on the manifestation of anthropometrical variables: body height (BOHE), body mass (BOMA), perimeter of sternum (PEST), and perimeter of upper arm (PEUA), with young athletes aged 15-16 old years, respectively, to is possible to forecast the results of these criterion tests based on measures of the predictor system participants.

***Key words**: anthropometric characteristics, regression analysis, running short distance, young athletes.*