THE INFLUENCE OF ANTHROPOMETRIC VARIABLES IN AGILITY ABILITIES OF YOUNG BASKETBALL PLAYERS

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Abstract
The aim of this research is the influence of anthropometric variables on successful realization of agility tests to 14-15 years of basketball players. In this research are tested 84 basketball players of 7 active cadet equips (groups)-males. Through the regressive analysis procedure where are foreseen 11 predictor anthropometric variables, while 2 agility test criteria. The results that are presented in the basic parameters show that anthropometric variables and agility tests have shown homogeneous distribution. Results of regression analysis variables body height, leg length and thigh circumference have a low impact with agility tests, while other anthropomorphic variables did not affect agility tests.

Key words: *anthropometric variables, agility abilities, basketball players aged 14 to 15 years.*

Introduction

Agility is also important in youth basketball. The age of fourteen represents the second phase in youth sports training: athlete development, talent identification, development of basic technical skills, development of basic tactical skills, and competition (Bompa, 2000). There are three good periods for developing speed and agility the accelerated run from the ages of 12 to 14, agility run at 13 and interval training of speed at 15 years of age. Anthropometric features and motor skills are very important factors in basketball. It is desirable to have long and agile players, so agility is a complex skill that depends on the coordination, common system mobility, dynamic balancing, strength, elasticity, stabilization, explosive strength, speed, and so on. In the field of motor and functional skills, we may notice that the intensification of the game requires preparation of the most aerobic and anaerobic systems of the players, increasing the ability to perform technical elements and tactics with maximum intensity, agility development and explosive motion response (KaralejicM,et al… 2011; Apostolidis N. et al. 2015).

Body height has a positive influence on all the body segment lengths and, in turn, athletic performance. Successful competition in sports has been associated with specific anthropometric characteristics, body composition and somatotype (Classens et al., 1991; Carter & Heath, 1990). The body mass of the 14 year-olds were in the 90th percentile compared to the American population (Malina, Bouchard, & Bar-Or, 2004). These results could be incorporated into a database against which talented 14 year-old basketball players could be compared. The results of three regression analyses indicate a moderate but significant influence of anthropometric variables on the results of three applied agility tests (Jakovljević, S. et al…2011). Jakovljević et al. (2011) found similar results for the sample of senior elite basketball players. The sum of skinfolds was used in this study to assess the influence of body fat mass on agility abilities of the 14 year-old male basketball players. It is known that body mass may be an aggravating factor in the speed at which a change in direction takes place, since basketball player needs to overcome his inertial characteristics. He has to produce a rapid increase in work effort to get started, as well as reduce the moment of inertia of the body in the deceleration phase. Researches-experiments have to dealing with the performance of young cadet league players, and are a modest contribution with the intention of introducing the necessary provisions for future players. Almost in this research we will try to validate the impact of anthropometric characteristics as a predictor in the successful realization of agility tests in the basketball game as a criterion. The purpose of this research is to influence in anthropometric characteristics as a predictor in the successful realization of agility tests in the basketball game as a criterion.

Methods

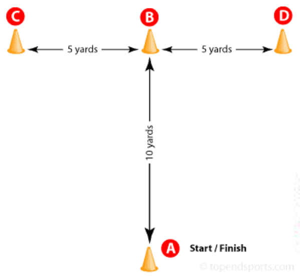
Sample entities
This paper consists active players (males) of age 14- 15 years old who plays in cadet's league. The total number of entities tested in this research is 84, divided into 7 teams with 12 players in the state of Kosova. The variables for anthropometric measurements are treated with 11 variables as predictors and two variables as criteria**.**

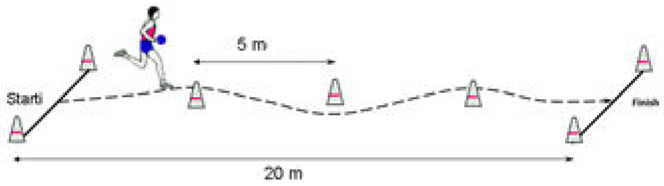
Predictive variables
ABADWE-Bady Weights, ABADHE-Body height, ALENGL- Length of leg, AARMLE-Arms length,

AFOOLE-Foot length, AFOOTW-Foot width, APALML-Palm length, APWOFI-Palm width with open fingers, AARMCI-Arm circumference, ATHICI-Thighs circumference, ACALCI- Calf circumference.

Criteria variables

MTTEST-T-Agile testdheMBDBCZ- Ball dribble between cones (zig–zag) 20 m. The measuring instruments are based on the authors**:** Jakovljević, S. Karalejić, M., Pajić, Z., Gardašević, B., Mandić, R. (2011).





Methods for completing the results

Data analysis was finished by using the statistical software program SPSS 21.0 version of Windows. For the influence of predictive variables on those criteria it was used the regression analysis.

Results and discussion

Table 1. Basic statistical parameters anthropometric and agility abilities.

	N	Min.	Max.	Mean	Std. Dev.	Skewness	Kurtosis
MTTEST	84	9.19	16.56	11.3986	1.34541	1.347	2.569
MDTMKZ	84	4.84	7.87	5.9826	.55703	.695	.777
ABADWE	84	38.00	100.00	63.7143	12.76816	.386	.386
ABADHE	84	148.00	187.00	173.1357	8.71214	-.464	-.284
ALENGL	84	87.00	113.00	101.3988	5.41182	-.232	.095
AFOOLE	84	23.00	30.00	26.5452	1.42494	-.180	.171
AFOOTW	84	8.40	12.50	9.9036	.71716	.328	1.216
AARMCI	84	10.00	35.50	26.0048	4.07969	-.335	1.774
ATHICI	84	40.00	69.00	51.5738	5.65509	.679	.960
ACALCI	84	28.00	45.00	35.8845	3.36099	.277	.289
APALML	84	15.10	21.10	18.3381	1.20810	-.244	-.218
APWOFI	84	17.50	24.80	21.3976	1.59464	.002	-.287
AARMLE	84	150.00	196.00	178.2202	10.58680	-.643	-.343

According to what is listed in Table 1 we see that anthropometric variables and agility tests have shown normal distribution. The results that are presented we may see by the distribution curve asymmetry and the presumption of the distribution curve shows that the results are distributed by positive asymmetry but some results have negative asymmetries.

Regression analysis

Table 2. Regression of the T-test.

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig.
1	.532[a]	.283	.173	1.22343	.283	2.580	11	72	.008

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	42.473	11	3.861	2.580	.008[b]
	Residual	107.768	72	1.497		
	Total	150.241	83			

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	10.342	6.179		1.674	.099
	ABADWE	-.055	.050	-.525	-1.113	.270
	ABADHE	-.092	.049	**-.595**	-1.865	**.066**
	ALENGL	.108	.059	**.435**	1.844	**.069**
	AFOOLE	.195	.160	.207	1.224	.225
	AFOOTW	-.094	.269	-.050	-.351	.727
	AARMCI	.047	.066	.141	.709	.481
	ATHICI	.155	.080	**.651**	1.923	**.058**
	ACALCI	.014	.103	.034	.134	.894
	APALML	-.217	.200	-.195	-1.085	.281
	APWOFI	-.122	.121	-.144	-1.005	.318
	AARMLE	.012	.038	.096	.318	.751

If predictive variables are analyzed, we may see variables (ATHICI-Thighs circumference), (ABADHE-Body height) and (ALENGL-Length of leg) have significant, significant statistical impact on predicting the outcome of the criteria variable.

Therefore, the singular interpretation of the anthropometric variables (predictor) on the T-test agility test (criterion) is low. In table no. 2 are the results of the regression analysis, where as the criterion is taken of the agility test variable and as the predictor (predictor) there are 11 variables of the anthropometric area. By analyzing table no. 2 we may note that multiple correlation is (R = 28), which explains about 17% of the common variability between the prediction variables system and the criterion. This correlation is important atlevel P = .008. In the rest of the total variability (53%) is under the influence of unknown factors and not included in this field.

Table 3. Test regression ball dribble between cones (zig-zag) 20 m.

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig.
1	.537[a]	.289	.180	.50436	.289	2.658	11	72	.006
a. Predictors: (Constant), VAR00024, VAR00019, VAR00023, VAR00018, VAR00017, VAR00021, VAR00022, VAR00016, VAR00020, VAR00015, VAR00014									

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	7.438	11	.676	2.658	.006[b]
	Residual	18.315	72	.254		
	Total	25.754	83			
a. Dependent Variable: VAR00009						

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	6.192	2.547		2.431	.018
	ABADWE	-.011	.021	-.260	-.554	.582
	ABADHE	-.036	.020	**-.561**	-1.767	**.081**
	ALENGL	.049	.024	**.478**	2.035	**.046**
	AFOOLE	.043	.066	.109	.647	.520
	AFOOTW	-.056	.111	-.072	-.505	.615
	AARMCI	.026	.027	.188	.946	.347
	ATHICI	.026	.033	.261	.775	.441
	ACALCI	.049	.042	.296	1.159	.250
	APALML	-.097	.082	-.211	-1.183	.241
	APWOFI	-.031	.050	-.088	-.616	.540
	AARMLE	-.001	.016	-.015	-.051	.959

If predictive variables are analyzed, may see variables (ABADHE-Body height) and(ALENGL-Length of leg)have shown significant, significant statistical impact on predicting the outcome of the criteria variable.

Therefore, the separate interpretation of the table would not be necessary because the impact of anthropometric variables on the 20-meter dribble test is very low.

In table no. 3 are the results of the regression analysis, where as the criterion is taken the dribbling test variable of 20 meters ball as predictor (predictor) are 11 variables of anthropometric space.

By analyzing table no.3, we note that multiple correlation is (R = 28), which explains about 18% of the common variability between the prediction variables system and the criterion.

This correlation is important at level P = .006. In the rest of the total variability (53%) is under the influence of unknown factors and not included in this field.

Conclusion

A sample of 84 young basketball players aged 14-15 males are taken 11 variables of anthropometric field as a predicator and 2 agility tests as a criteria. Based on the intent and importance of this paper, the impact of anthropometric variables on the performance of agility tests has been studied. The results of basic anthropometric parameters and agility tests as we see have a normal distribution of results. We will also see the impact of anthropometric variables (predictor) with T-test as criterion is important at P = .008 level, and as we see the results we may see separately that show the influence is low in the variables of the thigh, height body and foot length. While the influence of anthropometric variables as a predictor in the dribbling test of the 20-meter ball as the test criterion we see that the level of significance in this table is P = .006, we see that in all variables separately impact on the drift test 20 meters.

So, finally, we see the results of this study show that anthropometric variables have no effect on the results of basketball players of this age on the two agility tests.

References

Apostolidis, N., & Zacharakis E. (2015). The influence of the anthropometric characteristics and handgrip strength on the technical skills of young basketball players. *Journal of Physical Education and Sport 15*(2), 330-337.

Bompa, T. (2000). *Total training for young champions.* Champaign, IL: Human Kinetics.

Carter, J.E.L., & Heath, H.B. (1990). *Somatotyping: development and application.* Cambridge: Cambridge University Press.

Claessens, A.L., Veer, F.M., et al. (1991). Anthropometric characteristics of outstanding male and female gymnasts. *Journal of Sports Science, 9*, 53-74.

Malina, R.M., Bouchard, C., & Bar-Or, O. (2004). *Growth, Maturation and Physical Activity.* Champaign, IL: Human Kinetics.

Karalejic, M., Jakovljevic, S., & Macura, M. (2011). Anthropometric characteristics and technical skills of 12 and 14 year old basketball players. *J Sports Med Phys Fitness, 51*(1), 103-110.

Jakovljević, S., Karalejić, M., Pajić, Z., et al. (2011). Ubrzanje i promena smera i načina kretanja kvalitetnih košarkaša. [Acceleration and speed of change of direction and the way of movement of quality basketball players. In Serbian.]. *Fizička kultura, 65*(1), 16-23.

Jakovljević, S. Karalejić, M., Pajić, Z., Gardašević, B., Mandić, R. (2011). The influence of anthropometric characteristics on the agility abilities of 14 year-old elite male basketball players. *Facta Universitatis Series: Physical Education and Sport, 9*(2), 141 – 149.

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