A STUDY ABOUT POSSIBLE ASSOCIATION FOR ANTHROPOMETRIC WITH SPRINT AND AGILITY IN YOUTH BASKETBALL PLAYERS

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Abstract

The purpose of this scientific paper is to find out possible association for anthropometric with sprint and agility in youth basketball players. Basketball players in youth teams, regular participants, were included in this study in the national championship. In the study took part youth basketball players from four teams that were participated regularly in basketball championship in Albania (N= 45). Body height, body weight, waist where measured to assess anthropometric parameters in youth basketball players. To assess speed were used 10m and 20m sprint test test while to assess agility were used 10x5m shuttle run test. To find out possible association of anthopometrics to speed and agility the database was split by body weight groups (10 kg). All the variables of evaluated in this study were tested for normality. All statistical analyzes were performed using software SPSS 20.0. Result from this study found there was no association between body height to sprint and agility and body height with sprint agility. While splited the database by body weight group also statistical analysis found no association. Only for 50-59 kg age group was found negative association by body height with sprint 10m r= -.953** (p-0.003) and 60-69 kg also negative association = -.908* (p=0.012). Also data show negative association for body height and sprint 20m r= -.762* (p=0.01) for 60-69 kg age group.

Keywords: youth, basketball, anthopometric, agility, sprint

Introduction

The essential principles state that the lower the level of performance or the degree of training, the more elementary will be the ways by which its improvement is achieved. For the most elementary level, a few force stimuli produced during the game activity are sufficient. Above all, in the training of children, the stimuli provoked by the load of the game during the training, are sufficient to improve the quality of the strength of the speed. If it is desired to improve the general level of strength (in order to strengthen those trunk muscles that are exercised less in basketball, or to avoid the muscular imbalances that are typical of this sport), simple stretching exercises are sufficient or other training through play that is appropriate for the age group in question. Here we can mention as an example, exercises with jumps. Both maximal strength training and overload training should be excluded from this program, not only because of the high percentage of risk, but also because they are not yet necessary and appropriate for this age group. In fact, the greater the performance capacity or training level, the more we must turn to the most effective ways and combinations of methods. The rapid force movements are controlled by a motor program, i.e. they are performed according to a program that is "stored" in the central nervous system. For these types of movements, talented athletes possess a so-called "short time motor program", while those with less talent, "a longer time program" (Bauersfeld and Voss 1992).
These programs can be influenced to some degree by training, and are specific to one type of movement and no other. Movements with similar structures are controlled by the same time system programs (Bauersfeld and Voss 1992). In the event that in the past it was considered axiomatic that a very close relationship between maximum isometric strength and movement speed (Buhrler and Schmidtbleicher 1981) - commenting that an increase in isometric strength was always accompanied by an increase in movement speed - currently , the influence that maximal strength exerts on rapid strength together with the particular forms of its manifestation, is evaluated in a much more differentiated and critical manner. Maximum strength, as a non-specific basic strength, ranks second compared to a very specific form of fast strength, in the dynamics of which we must take into account not only the structure of the muscles, but also the internal coordination (within the muscle itself, ndt), the corresponding patterns of neural activity along with movement speed, movement angle (biomechanics) and muscle excitation (Craft, L. L., et al., 2003).

Methods

Basketball players in youth teams, regular participants, were included in this study in the national championship. In the study took part youth basketball players from four teams that were participated regularly in basketball championship in Albania (N= 45). Body height, body weight, waist where measured to assess anthropometric parameters in youth basketball players. To assess speed were used 10m and 20m sprint test test while to assess agility were used 10x5m shuttle run test. To find out possible association of anthopometrics to speed and agility the database was split by body weight groups (10 kg).

Speed (10 and 20m)

The purpose of this test is to determine the players' maximum sprint speed and ability of acceleration from static position. The device with which the measurements were performed: BROWER Timing System, constitute a system of devices for a perfect and indisputable measurement. Subjects who will be tested must have done training before taking the test. It is highly recommended that each subject conduct one sub max run for at least 10 min, followed by a long stretch to get ready for test, the subject. For this test, the measuring units that make up the gates are at the level of the pelvis subject, where the infrared rays are also interrupted. The gates are placed 10 and 20 meters apart, where the start of the subject should be 30 cm above the first entrance gate. The subject starts from the established point e start without command, when he feels comfortable start the run, and finish at the second exit gate located 10 and 20 meters from the start. Each subject performs this test twice, with 5 minutes each difference from the first test, from which the best time is selected and obtained.

Agility

Objective agility (10x5 m)
The "Shuttle run" test, 10 x 5 meters (Eurofit., 1993), is performed to evaluate speed and agility of the lower limbs. Marker cones / or orienteering sights are placed five meters away. The subject prepares for testing, placing the foot on the starting line. The subject takes off when ready, and runs straight distance limit. This action is repeated five times without stopping (covering a distance of total of 50 meters). Each orientation line must be completely crossed with both feet. The test time is recorded. For this test, the

following equipment is required: Starter (electronic system Brower), adhesive marker, and a suitable, flat, non-slip surface.

Statistical analysis
To perform the statistical analysis, a special database was created in Excel). This database was then converted to the SPSS database (statistical program). Descriptive statistics (means, standard deviations, minimum values and maximum) for measurements were calculated for the variables assessed at this study (all tests performed in this study). All the variables of evaluated in this study were tested for normality. Correlation analysis were performed to evaluate possible association between variables. p level <0.05 (significant difference) was accepted in this study. All statistical analyses were performed by SPSS 20.0 software was used.

Results
Data on the table 1 show descriptive statistics with regard to body height, body weight, waist circumference, sprint 10m and 20m and agility 10x5m.

Table 1 Descriptive statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Body_Height	48	1.47	2.06	**1.6884**	.20598
Body_Weight	48	40.9	125.0	**64.604**	40.3684
Waist	47	60.0	114.0	**82.517**	7.3968
Sprint_10m	48	1.8	2.3	**2.041**	0.1757
Sprint_20m	48	3.0	5.2	**3.702**	0.4329
Agility_10x5m	47	16.1	26.8	**20.459**	0.8731
Valid N (listwise)	48				

Discussion

From this study while splited the database by body weight group also statistical analysis found no association between anthopometrics to speed and agility. Only for 50-59 kg age group was found negative association by body height with sprint 10m r= -.953** (p-0.003) and 60-69 kg also negative association = -.908* (p=0.012). Also data show negative association for body height and sprint 20m r= -.762* (p=0.01) for 60-69 kg age group.
The importance of the peak force component in the quick force increases as the load to be lifted increases. For example, if when bending the elbow with a weight of 13% of the maximum, the speed of lifting the weight depends on the extent of 39% of the maximum force, this figure increases to the extent of 71% when lifting a weight of 51% of the maximum (Verchoshansky, 1978).

Data from the table 2 show the descriptive statistics by body weight category (10 kg) for variables measured in the study

Table 2 Descriptive statistics by age category

Descriptive Statistics

Weight Category		Minimum	Maximum	Mean	Std. Deviation
30-39 kg	Body Height	1.27	1.43	1.3280	.06648
	Body Weight	30.9	40.3	35.120	3.7419
	Waist				
	Sprint_10m				
	Sprint_20m	4.1	4.9	4.448	.3780
	Agility_10x5m	21.7	27.1	23.630	2.0524
40- 49 kg	Body Height	1.44	1.59	1.5080	.05160
	Body Weight	43.8	49.6	46.420	2.0214
	Waist	60.0	60.0	60.000	0.1245.
	Sprint_10m	2.2	2.2	2.210	0.12456
	Sprint_20m	3.7	4.3	3.999	.1977
	Agility_10x5m	20.2	23.8	21.605	1.1175
50- 59 kg	Body Height	1.55	1.84	1.7026	.10232
	Body Weight	55.0	58.0	56.488	.8610
	Waist	69.0	74.5	70.417	2.1545
	Sprint_10m	1.8	2.3	2.070	.2352
	Sprint_20m	3.2	3.7	3.479	.1669
	Agility_10x5m	17.1	20.6	19.034	1.1820
60- 69 kg	Body Height	1.56	1.82	1.7107	.07779
	Body Weight	62.0	68.3	64.950	2.5185
	Waist	69.0	83.0	75.786	4.6535
	Sprint_10m	1.9	2.3	2.093	.1969
	Sprint_20m	3.1	4.1	3.484	.3487
	Agility_10x5m	16.9	26.6	18.871	2.7823
70- 79 kg	Body Height	1.59	1.95	1.7890	.13338
	Body Weight	74.2	80.0	77.213	1.8466
	Waist	81.0	91.0	85.071	3.9415
	Sprint_10m	1.8	2.3	1.953	.1663
	Sprint_20m	3.0	4.2	3.385	.4119
	Agility_10x5m	16.1	22.8	18.796	2.4322
80+ kg	Body Height	1.84	2.06	1.9622	.07726
	Body Weight	81.0	125.0	96.811	13.0430
	Waist	86.0	114.0	96.333	9.6437
	Sprint_10m	1.8	2.2	2.028	.1262
	Sprint_20m	3.0	3.8	3.282	.2476
	Agility_10x5m	17.3	21.3	18.742	1.4708

Data on the table 3 show correlation between anthopometrics with speed and agility

Table 3 Correlation between body height and weight with sprint and agility

Correlations

Age_Category			Sprint_10m	Sprint_20m	Agility_10x5m
30-39 kg	Body_Height	Pearson Correlation	-0.457	-0.746	-0.754
		Sig. (2-tailed)	0.87	0.147	0.141
	Body_Weight	Pearson Correlation	-0.348	-0.778	-0.613
		Sig. (2-tailed)	0.97	0.121	0.272
40- 49 kg	Body_Height	Pearson Correlation	-0.457	0.047	-0.175
		Sig. (2-tailed)	0.89	0.898	0.628
	Body_Weight	Pearson Correlation	-0.641	0.112	-0.106
		Sig. (2-tailed)	0.94	0.758	0.771
50- 59 kg	Body_Height	Pearson Correlation	-.953**	-0.747	-0.627
		Sig. (2-tailed)	0.003	0.053	0.096
	Body_Weight	Pearson Correlation	-0.007	-0.113	-0.083
		Sig. (2-tailed)	0.99	0.81	0.844
60- 69 kg	Body_Height	Pearson Correlation	-.908*	-.762*	-0.292
		Sig. (2-tailed)	0.012	0.01	0.413
	Body_Weight	Pearson Correlation	-0.632	0.117	0.322
		Sig. (2-tailed)	0.178	0.748	0.364
70- 79 kg	Body_Height	Pearson Correlation	-0.332	-0.65	-0.369
		Sig. (2-tailed)	0.521	0.081	0.368
	Body_Weight	Pearson Correlation	0.333	0.128	0.225
		Sig. (2-tailed)	0.519	0.763	0.592
80+ kg	Body_Height	Pearson Correlation	0.031	0.106	0.368
		Sig. (2-tailed)	0.936	0.786	0.33
	Body_Weight	Pearson Correlation	0.363	0.412	0.606
		Sig. (2-tailed)	0.337	0.271	0.084

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

The ratio between maximum force and speed of movement increases as the weight to be lifted increases. It shows how the force-time dependence curves show exactly this type of growth (the first part of the curve, ndt) both in the case of different dynamic loads and in isometric strength developments. In the game situation, the relationship between these components of quick force and maximum force is distinguished when the player has to accelerate or decelerate and for a time as short as possible, the excess weight represented by his body mass. During a match, players mainly execute acceleration (dynamic – positive) and stopping (dynamic – negative) movements, often in tight spaces.
According to Lewin (1975), high-level players, during a match, make 90 penetrations in the basket and approximately 70 explosions, in very short distances (less than 10m). Konzag (1965), have found that during a match, side players make up to 139 explosions. Classic examples of the expression of the "accelerating" type of force are jumps with the ball (shots in suspension, third times), or those without the ball (for possession of the ball on the boards, blocks, double jumps, etc.), passes , dribbles and bursts (running in one direction or changing position). During a match, a player makes about 70 jumps on average. On the contrary, in stops and unforeseen changes of direction, as well as in running and jumping in the opposite direction, we encounter forces of the braking type (eccentric).
Although the structural factors required by the model of a basketball player are those typical of an athletic, flexible and tall subject (Hagedorn et al. 1985), often in the training process, both players and coaches , the importance of the "maximum force" factor continues to be underestimated, due to the fact that there are still uncertainties and misconceptions about its influence on the smooth running of the game. When talking about maximum strength training, it is often wrongly imagined "body-building" and lifting weights, accompanied by the increase in muscle mass, typical for these activities. Until now, players and coaches have neglected strength training, with the justification that it would impair the accuracy of the execution of the shots, the speed of the actions and the mobility on the field of play (Jonath and Kremple 1981). But specialist Schonfelt has managed to prove that even after strength training, the percentage of free throws made does not deteriorate, if immediately after training with weights, a "stretching" program would be treated. We must also emphasize that n.q.s. during the training process, the handling of the quick force would be carried out correctly, this would help not only to improve the playing skills - especially if we consider that the increase in the vertical strength of the jump and of the hands, of the upper limbs and the trunk is often decisive for possession of the ball - but it would also significantly reduce the risk of trauma (Pauletto 1994).
Burst velocity depends to a significant extent on the time-stretched acyclic program (Weineck 1997), and on particular strength qualities, such as, for example, the player's horizontal and vertical jump strength. It should be emphasized that an important influence on its development is determined by jumps and their combinations, also by a special speed strength training (Weineck 1994).
The ability to accelerate is a relatively special parameter, and must be clearly differentiated from speed, in its conception as a quick coordination - and which represents, first of all, the expression of a coordinative quality. The high correlation coefficient with horizontal & vertical jumps emphasizes the fact that this quality is influenced by the strength of the lower limbs. Indeed, players presenting significantly higher sprinting indices also possess greater strength in horizontal & vertical jumps. In a prospective study that assessed the incidence of sports injuries among youth in schools over a 1-year period (Zaricznyj, B, et. al. 1980), strength training was found to account for 0.7% of 1576 injuries in total, while football and basketball resulted in approximately 19 and 15% of all injuries. When the data were evaluated in terms of injury, in relation to participants in school sports teams, football (28%), wrestling (16.4%), and gymnastics (13%) were at the top of the list. In general, injuries related to strength training in athletes e secondary schools seem to depend on progressively increasing workloads aggressively over time training or using wrong techniques in training (Brady, T, et. al. 1982; Gumbs, V, et. al. 1982). Findings from the High School Sports Injury Surveillance Study in
2005-2006 found that participation in sports teams resulted in approximately 1.4 million injuries at a rate of 2.4 injuries per 1,000 athletes exposed (eg during training or competitions).
In conclusion from this study statistical analysis found no association between anthopometrics to speed and agility.

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