THE CORRELATION BETWEEN BODY MASS AND HEIGHT WITH MOTOR ABILITIES IN YOUTH BASKETBALL PLAYERS

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Abstract

The main forms of motors skills, represented by sustainability, strength, speed, articular movement and coordination skills, constitute the basic premise for the acquisition and implementation of motor movements, physical-sportive ones especially in basketball. The goal of this study was to find out the correlation between anthropometric parameters (body mass and height) with sprint and agility/ quickness in youth basketball players. In this study participated 56 basketball players (17.4 yrs, 0.5 SD). They underwent the measurement for body height and body mass as sprint test (10 m and 30m) and agility/ quickness test (10x5m) performed in the field. All measurement were tested for normality and Pearson correlation coefficient was used to find out the association between variables.

Results showed that: body mass was correlated with 10m sprint (r= -0.323 p= 0.305), 20m sprint (r= -0.794** p= 0.002) and 10x5 m agility (r= -0.658* p= 0.02). Body height was correlated with 10m sprint (r= -0.505 p= 0.094), 20m sprint (r= -0.776** p= 0.003) and 10x5 m agility (r= -0.699* p= 0.011). In conclusion data results showed the importance of maintaining a balance body weight with regards to age, and anthropometric parameters play a crucial role in the performance of sprint and agility in basketball.

Keywords: basketball, youth, sprint, agility

Introduction

The main forms of motors skills, represented by sustainability, strength, speed, articular movement and coordination skills, constitute the basic premise for the acquisition and implementation of motor movements, physical-sportive ones especially in basketball. There is a study connection between body structure and aerobic abilities. When body mass and fat heft rises, aerobic capacity seems to drop (Sotiropoulous, et al., 2009). Nevertheless, reduction of fat mass and growth of lean body mass evidently enhance VO2 maximum (Macpherson, et al., 2011). The recognized advantages of performing sports distinct training is that the training will shift better into the sportsmen competitive habitat and that the greatest exercising profits happen when the exercising impetus simulates the particular motion patterns and physiological requirements of the sport (McArdle, Katch and Katch 1996). In basketball, systematic and strenuous training of the sport leads to a major enhance in athletic harms (Baskiroff, 1990; Ellfeldf et al., 1986). The injuries may affect the ligaments, the muscles, or regarding the bones and can be caused by deficiency of muscle equilibrium between the lower limbs of the player, where the majority of the injuries happens (Mirkin et al., 1985; O Neil et al., 1988; Shambaugh et al., 1991). Being part of a basketball team the professional athlete must improve in continuance fulfilling these two important physical criteria: physical condition and the level of technical ability. The goal of this study was to find out the correlation between anthropometric parameters with sprint and agility in youth basketball players.

Methods

In this study participated 56 basketball players (17.4 yrs, 0.5 SD). They underwent the measurement for body height and body mass as sprint test (10 m and 30m) and agility test (10x5m) performed in the field.

All measurement were tested for normality and Pearson correlation coefficient was used to find out the association between variables.

Protocols of the tests
Speed (Eurofit 1993)

Objective of the Speed test(10 and 20m)
The purpose of this test is to determine the maximum speed of the players in sprint and acceleration capability from the static position in basketball players.
Procedure
Subjects which will be tested should have done warm-up before conducting the test. It is highly recommended that any subject to perform a sub maximal running for at least 10 min, followed with a long stretching to be ready for the test. Each subject performs the test twice, with 5 minutes apart from the first one, from which is selected and obtained the best time.

Coordination/ Agility (Eurofit 1993)

Objective of coordination (agility/ quickness) measurement, (10 x 5m).
Shuttle run Test, 10 x 5 metres (Eurofit., 1993), is carried out to evaluate the speed and coordination of the lower limbs.
Procedure
Target cones/ or orientation lines, placed five meters away. Subject prepares for testing, setting foot on the starting line. Subject starts when he is ready, and runs towards the distance border. This action is repeated five times without stopping (covering a total distance of 50 meters). Every orientation lines should be fully passed with both feet. Testing time recorded.

Statistical analysis

Descriptive statistics (mean values, standard deviations, minimum and maximum values) for comparison statistics were calculated for variables assessed in this study (all tests performed in this study). All analysis were performed with SPSS software 20.0. All measurement were tested for normality and Pearson correlation coefficient was used to find out the association between variables.

Results
Mean age of participants of the study was 17.4 years old (standard deviation 0.5, the min value 16.8; max 17.7 yrs) while mean body mass 72.4 kg (standard deviation 7.2 kg), with mean minimum values 59.9 kg and maximum 84.1 kg.
The mean body height values are 1.78 m (standard deviation 0.03 m), with mean minimum values 1.72m and maximum 1.85 m and mean BMI values are 22.3 kg/m2 (standard deviation 1.54 kg/m2), with mean minimum values 19.8 kg/m2 and maximum 24.3 kg/m2.

Results on table 2 showed that: body mass was correlated with 10m sprint (r= -0.323 p= 0.305), 20m sprint (r= -0.794** p= 0.002) and 10x5 m agility (r= -0.658* p= 0.02). Body height was correlated with 10m sprint (r= -0.505 p= 0.094), 20m sprint (r= -0.776** p= 0.003) and 10x5 m agility (r= -0.699* p= 0.011).

Table 1 Mean values for health parameters of basketball players

	N	Min	Max	Mean	Devi Stand
Age	56	16.8	17.7	17.4	0.5
Body Mass	56	59.9	84.1	72.4	7.2
Body Height	56	1.72	1.85	1.78	0.03
BMI	56	19.8	24.3	22.3	1.54

Table 2 Body mass and body weight correlation with sprint parameters

		Sprint 10 m	Sprint 20 m	Agility 10x5 m
Body mass	Pearson Correlation	-0.323	-0.794**	-0.658*
	Sig. (2-tailed)	0.305	0.002	0.02
	N	56	56	56
Body height	Pearson Correlation	-0.505	-0.776**	-0.699*
	Sig. (2-tailed)	0.094	0.003	0.011
	N	56	56	56

Discussion

In conclusion data results showed the importance of maintaining a balance body weight with regards to age, and anthropometric parameters play a crucial role in the performance of sprint and agility in basketball. The results show that body mass was correlated with 10m sprint (r= -0.323 p= 0.305), 20m sprint (r= -0.794** p= 0.002) and 10x5 m agility (r= -0.658* p= 0.02). Body height was correlated with 10m sprint (r= -0.505 p= 0.094), 20m sprint (r= -0.776** p= 0.003) and 10x5 m agility (r= -0.699* p= 0.011).

Along with these requirements body structure and muscular physique, has substantial importance regarding this sport. Strength training affect better in decreasing injury in athletes (McKeag, 2003), and most of the time affects improving motor performance (Fleck & Kraemer, 2004; Micheli, & Purcell, 2007) so is also a very important part of basketball off-season programs (Fulton, 1992, Price, 2006). The importance of coming up with qualitative conditioning schedules founded on the particular physiological requirements of every sport is viewed as a key element to success (Gillam 1985; Taylor 2003 & 2004). As stated by Vanttinen and his associates (2011), that aerobic exercising helps in reducing body tallow, fat size and enhance slim body mass. Improved balance as a result of the conducted jump test can be associated with increased endurance of the central part of the body, which allows improved ability to react to external stress and axioms during athletic activity (Myer et al., 2004). Research has shown that motion simulation training and the central body functional strength improve the dynamic equilibrium (Holm et al., 2004; Paterno et al., 2004; Myer et al., 2006).

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