Republic of Albania

Sports University of Tirana

Faculty of Movement Sciences

DOCTORAL THESIS SUMMARY

FIELD OF THE STUDY: SPORT SCIENCE

Topic: A monitoring study on changes in physical parameters to young players throughout 5 months of training in football teams in Shkodra.

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Introduction

The performance of a variety of strength, speed, and strength improves more or less proportionally to body mass gains, as well as improving balance and coordination between the ages of 5 and 8. In the adolescent transition phase (8 to 12 years old), performance in motor skills (many of them non-aerobic), strength and aerobic exercise are generally improved with age (Malina & Bouchard 1991). Regular football practice has a positive effect on the performance of motor skills, speed and skill of boys aged 10-11. The best performance of soccer practitioners is certainly a consequence of regular football training, which also seems to bring acceleration to physical growth (Navarro F, 2000). An important implication for youth football is that individual growth rates need to be considered. However, some authors indicate that they respond to resistance training with increased strength, probably due to changes in the coordination of the nervous system (Malina 2003; Malina et al., 2005). In this line of thought, another study (Mass & Nicolai 2006) finds that youth sports programs should focus on controlling and regulating speeding mechanisms during childhood rather than on metabolic and muscular mechanisms, which should be highlighted After puberty, despite the predominance of muscular strengthening responsive to the game's posture (Toteva 1999). Some studies (Barata 2000; Marques & Oliveira J, 2004; Rowland & Boyajian A, 1995) point to the speed that reveals the highest levels of speed development based on coordination activities 6-9 years of age. Another study concluded that growth in body size during the growth and maturation phase is strongly linked to increased psychological performance (Weineck J, 2004). Sports exercise during growth depends on morphological characteristics and maturation stage (Figueiredo et al., 2009). It was later discussed that upper secondary childhood limits may be difficult to separate learning outcomes from those related to growth and maturation. A general attention should be focused on the exercise of overall sustainability with a particular focus on fundamentals and flexibility in general (Bompa TO, 2000).

Methods

However the aim of this study was to give evidence on changes in physical parameters to young players throughout 5 months of training in football teams in Shkodra.

Objectives

1-Measurement of physical parameters: speed, aerobic endurance, explosive force of the lower limbs, force of the upper limbs, velocity, agility.

2-Continuous monitoring of these parameters during the entire training period.

3-Measurement of physical parameters at the end of the 5-month training period of these young players

Hypothesis:

At the end of the 5-month training period during the second measurements we hypothesize that:
1. There will be significant visible improvements in the parameters of the explosive force, speed and skill parameters.

2. There will be significant improvements in the parameters of the explosive force of the lower and upper limbs.

3. There will be no significant improvements in aerobic fitness for young people in football.

Participants

Selection of the sample Measurements were made in 2 teams of the city of Shkodra. In these measurements participated 78 boys players in the first and second phase of the measurements for a period of 5 months.

The selection of the sample was made occasionally by six teams of the city of Shkodra. Participants Sampling consists of 78 players from the category U15 of the league in the city of Shkodra during the season 2015-2016 (age: 14.7 years (SD 0.5); body height: 158.2 cm (SD 7.8 cm), body weight: 49.6 kg (SD 5.2 kg).

Players completed 2 measurement stages during the 5-month cycle. The average football player experience was 4.2 years (SD = 0.9 years). During the test, everyone was healthy and no one was injured.

The participant undertook anthropometrics parameters evaluation and performed three speed test (10m and 30m sprint test, speed and agility 10x5m).

The necessary measurements for testing were:• for the maximum capacity of the Vo2max oxygen (Shutlle run test). Milestones have been used at both ends of the field • for the strength of the lower limbs (long-distance jump test) with use the meter extending to the ground and for speed (10x5m test) with use 2 milestones at each edge.

Protocol of the tests

Standing long jump

The purpose of this test was evaluation of functional force, neuromuscular control and dynamic strength of lower extremities. Equipment needed were standard measuring tape or testing tapes to measure the horizontal jump distance, flat non-slipping testing surface. The measurement of the lower limbs is done by the standing long jump test. This measurement is performed in open or closed environments. On the right or left side, a meter is placed in order to measure how much an athlete will jump while the is placed on the floor. The instructor explains the jumping mode and gives the signal that the athlete performs jumping. The aim is how much the athlete is jumping, which shows the strength of the lower limbs.

Speed and agility 10x5 m

The purpose of this test was testing speed and multi-directional skills and body control. The equipment needed were flat-slip surface, stopwatch, measuring tape. Speed measurement is done by test 10x5m. This test is carried out at a distance of 5m. At the ends of this distance, two points are set so that the athlete can be guided during the exercise (test). Athletes should perform this interval of 5m- 10 times. After the instructor gives the signal, the athlete starts running and based on the time he / she is to decide, the speed of test performed.

Sprint test 10m and 30m

The aim of these tests was to measure the athlete’s linear speed capabilities (10m and 30m). The sprint tests were used to measure acceleration from a static position

Dynamic sustainability of abdominal muscle

The purpose of this test was evaluation of dynamic abdominal muscles in the lying position at the back at a certain repeat rate. The equipment needed were stopwatch, solid table for test surface, two adhesive tapes throughout the test surface, preliminary recordings (tape, etc.).

Strength of upper limbs (push up test)

The purpose of this test was evaluation of muscular strength of high extremities and their sustainability. The equipment needed were sustainable testing surface.

Cardiorespiratory fitness

To carry out the measurement of Vo2max, Shuttle run test was done. Test conducted on open or closed ground. Field dimensions have a length of 20 m. The athletes are placed in an area of the field where they run to the other area of the field and return for a period of 10 min using a beep test. Beep test through a computer gives the signal for the start and end of the test, where the athlete run for the entire test until maintaining the rhythm of the test from one side to the other. Here the total turnover of the athlete is measured and the result of the formula is returned in ml / kg/min where is the consumption L (vo2max).

Statistical analysis

To perform the statistical analysis, a special database of Excel data was created (pre- and post-intervention tests) and then used the SPSS 20 software to perform statistical analyzes such as descriptive, correlation, and T tests to make the difference between first and second measurements for each skill. An analysis of correlation was used to determine whether there was association for body weight and height with each variable assessed (motor abilities) in this study. All of the data were conducted using SPSS, version 20.0 (SPSS, Inc. Chicago, IL, USA). The significance level was set at $p < 0.05$.

Results

Data on table 1 shows the variables/ tests measured in the study with the participation of athletes before and after the monitoring phase. Anthropometric measurements have been attended by all athletes in measurement before and after monitoring of the program. In the measurement of speed and agility in the second measurements did not participate 2 footballers. While in the measurements of aerobic capacity and the force in the second measurements did not participate 1 player.

On the first day anthropometry and force measurements were performed, where in the second phase of their measurement, a sportsman had muscular problems.

Table 1.

Data on the participation of 15 year olds (14.7 years old) in the 5-month intervention phase.

		Pre	Post	Missed
Weight	kg	78	78	0
Height	m	78	78	0
BMI	m/kg2	78	78	0
Pec body fat	mm	78	78	0
Pulse rest	n	78	78	0
Speed 10m	s	78	76	2
Speed 30m	s	78	76	2
10x5 m	s	78	76	2
cardiorespiratory fitness	m	78	77	1
Standing long jump pre (m)	m	78	77	1
Push up pre (time)	Time	78	77	1
Abdominal pre (time)	Time	78	77	1

Data on table 2 shows the descriptive analysis (minimum, maximum, average, standard deviation) of the measurements of velocity, agility, aerobic capacity and forces carried out in the first phase of the tests. In the first 10m distance test we note these

The data: minimum 1.65s, maximum 3.27s, meanwhile 2.15s (dv 0.37s). In the first 30m distance tests we estimate these data: minimum 4.05s, maximum 6.25s meanwhile 4.81s (dv 0.50s). The first tests of dexterity taken from the 10x5m test have these values: minimum 17.28s, maximum 25.02s mean mean 20.59s (dv 1.31s).

In the first aerobic endurance tests we have these measurement values: minimum 300 m , The maximum 940m, while the 559.29m (dv 192.18m) mid-range. The first tests of the force measurement for the lower limbs through the crossroads of the country have these values: minimum 1.45m, maximum 2.42m meanwhile 1.92m (dv 0.29m) .In the first tests of force measurement pe

The upper limbs realized by lowering (pumps) with the force of the arms have the following data: minimum 6 lift-ups, maximum 40 downs-downs, meanwhile 18.86 ups (up 7.22 ups). The first measurements of the abdominal force (abdominal muscles) through the folds of the trunk with fixed legs have the following test results: minimum 13 folds, maximum 80 folds, meanwhile 40.71 leaflets (16.50 folds)

Table 2.

Descriptive data on speed, agility, aerobic capacity and force measurements in the first measurement phase.

	Min	Max	Mean	Stand Dev
Speed 10m	1.65	3.27	2.15	0.37
Speed 30m	4.05	6.25	4.81	0.50
10x5 m	17.28	25.02	20.59	1.31
cardiorespiratory fitness	300	940	559.29	192.18
Standing long jump pre (m)	1.45	2.42	1.92	0.29
Push up pre (time)	6	40	18.86	7.22
Abdominal pre (time)	13	80	40.71	16.50

Table 3 gives data on the first and second measurements of weight, length and BMI and the mean, standard deviation and standard error of the average.

The results of these measurements represent these values and the weights first have these values: average 49.4 kg, standard deviation 10.39 kg and standard error of average 1.47 kg. Meanwhile the weights in the second measurements represent these values: the average 52.9 kg, the standard deviation 9.67 kg and the standard error of average 1.37 kg. The results of the first measurements for the length represent these values: average 156.6 cm, standard deviation 11.12 cm and average error of 1.57 cm average.

Meanwhile, the results of the second longitudinal measurements represent these values, namely: average 160.1 cm, standard deviation 10.78 cm and average error of 1.52 cm average. In this table we present the results of the first BMI measurements with these values respectively: average 20.0 m / kg2, standard deviation 2.74 m / kg2 and standard error error 0.39 m / kg2. Meanwhile, the second BMI measurements represent the following values: mean 20.5 m / kg2, standard deviation 2.52 m / kg2 and standard error of 0.36 m / kg2 average.

Table 3.

Comparative tables of first and second results of weight, length and BMI.

	Mean	Stand Dec	Mean Stand Error
Weight pre	49.4	10.39	1.47
Weight post	52.9	9.67	1.37
Height pre	156.6	11.12	1.57
Height post	160.1	10.78	1.52
BMI pre	20.0	2.74	0.39
BMI post	20.5	2.52	0.36

Table 4 shows descriptive data of the difference between the first and the second measurement results for weight, height and BMI. Specifically, the difference between the results of the first and second measurements of weight, represents the following values: average -3.5 kg, standard deviation 1.96 kg, standart error of average 0.28 kg ($p = 0.00$). Meanwhile, the difference between the results of the first and second measurements of the height presents the following values: average -3.5 cm, standard deviation 1.75 cm, standard error 0.25 cm ($p = 0.00$). We also present the results of the difference between the results of the first and second BMI measurements, which presents these values: average -0.6 m / kg2, standard deviation 0.83 m / kg2, standard error of average 0.12 m / Kg2 (p = 0.00).

Table 4

Descriptive chart of the difference between the first and second measurement results for weight, height and BMI.

	Mean	Dev Standart	Mean st Err	95% Diff IC		t	Sig. (2-tailed)
				Lower	Upper		
Weight pre-Weight post	-3.5	1.96	0.28	-4.06	-2.94	**-12.62**	**0.00**
Height pre-Height post	-3.5	1.75	0.25	-3.98	-2.98	**-14.04**	**0.00**
BMI pre – BMI post	-0.6	0.83	0.12	-0.79	-0.32	**-4.70**	**0.00**

Table 5 gives data on first and second speed tests of 10 m, 30 m speed and agility, and the mean, standard deviation and standard error of average. The results of these tests represent these values and, respectively, the 10 m speed in the first tests has these values: the mean 2.04 s, the standard deviation 0.32 s and the standard error of 0.05 s.

Meanwhile, the speed of 10 m for the second tests presents these values: mean 1.78 s, standard deviation 0.20 s and default standard error 0.03 s. The first test results for the 30m velocity range represent these values: mean 4.68 s, standard deviation 0.51 s and standard error of 0.08 s.

Meanwhile, the results of the second test for 30m speed represent the following values: 4.51 s average, standard deviation 0.36 s and default standard error 0.06 s.

In this table we have also presented the results of the first tests of agility with these values respectively: average 20.73 s, standard deviation 1.01 s and default standard error 0.17 s.

Meanwhile, the second tests of agility present these values respectively: mean 19.50 s, standard deviation 1.64 s and default standard error 0.28 s.

Table 1.

Comparative tables of first and second test results of 10 m speed, 30 m speed and dexterity.

	Mean	Stand Dev	Mean Stand Error
Speed 10m pre	2.04	0.32	0.05
Speed 10m post	1.78	0.20	0.03
Speed 30m pre	4.68	0.51	0.08
Speed 10m post	4.51	0.36	0.06
Agility pre	20.73	1.01	0.17
Agility post	19.50	1.64	0.28

Table 6 shows the description of the difference between the results of the first and second tests of speed 10 m, 30 m speed and agility. Specifically, the difference between the first and second test results of 10 m, presents the following values: mean 0.26 s, standard deviation 0.26 s and average error 0.04 s (p = 0.00).

Meanwhile, the difference between the results of the first and second tests of 30m velocity is the following: average 0.18 s, standard deviation 0.37 s and average error 0.06 s (p = 0.00). We also present the results of the difference between the results of the first and second tests of agility, which presents these values: mean 1.24 s, standard deviation 1.90 s and standard error of 0.32 s (p = 0.00).

Table 6.

Distinguishing table of the difference between the results of the first and second tests of speed 10 m, 30 m speed and agility.

	Mean	Dev Standard	Mean st Err	95% Diff IC		t	Sig. (2-tailed)
				Lower	Upper		
Speed 10m pre- 10m post	0.26	0.26	0.04	0.18	0.34	**6.41**	**0.00**
Speed 30m pre- 10m post	0.18	0.37	0.06	0.06	0.29	**3.05**	**0.00**
Agility pre- post	1.24	1.90	0.32	0.59	1.89	**3.86**	**0.00**

Table 7 gives data on the first and second tests of aerobic endurance, namely the mean, standard deviation and standard error of the average. The results of these tests represent these values and, respectively, the aerobic capacity in the first tests has these values: the average 650.0 m, the standard deviation 125.70 m and the standard error of the average 51.32 m. Meanwhile aerobic capacity for second tests presents these values: average 623.3 m, standard deviation 181.29 m and default standard error 74.01 m.

Table 7

Comparative Table of First and Second Test Results of Aerobic capacity.

	Mean	Stand Dev	Mean Stand Error
Aerobic m pre	650.0	125.70	51.32
Aerobic m post	623.3	181.29	74.01

Table 8 shows descriptive data on the difference between the results of the first and the second tests of aerobic capacity. Specifically, the difference between the results of the first and the second aerobic capacity tests is the following: average 26.66667 m, standard deviation 126.28 m and average error of 51.55 m (p = 0.63).

Table 8

Descriptive chart of the difference between the results of the first and the second tests of aerobic capacity

	Mean	Dev Standard	Mean st Err	95% Diff IC		t	Sig. (2-tailed)
				Lower	Upper		
Aerobic m pre- Aerobic m post	26.66667	126.28	51.55	-105.86	159.19	0.52	0.63

Table No.9 gives data on the first and second tests of the force of the lower limbs, the upper limb forces and the abdominal muscular force, and, respectively, the mean, standard deviation and standard error of the average.

The results of these tests present these values and, respectively, the strength of the lower limbs in the first tests has these values: the average 1.9 times, the standard deviation 0.3 times, and the standard error of the average 0.0 time.

Meanwhile the strength of the lower limbs for the second tests presents these values: the average 2.0 time, the standard deviation 0.3 times and the standard error 0.0 0.05. The results of the first tests for the force of the upper limbs represent these values: the average 17.0 times, the standard deviation 6.9 times and the default standard error 1.4 times.

Meanwhile, the results of the second tests for the upper limb force represent these values and, respectively, the mean 17.4 times, the standard deviation of 5.9 times and the default 1.2 standard error. In this table we present the results of the first abdominal muscle strength tests with these values respectively: the average 37.5 times, the standard deviation 11.6 times and the standard error of the imam 2.3 times. Meanwhile, the second tests of abdominal muscle strength represent the following values: mean 41.0 times, standard deviation 13.8 times and standard error 2.7 times.

Table 9

Comparative table of the results of the first and second tests of the force of the lower limbs, upper limbs and abdominal muscles.

	Mean	Stand Dev	Mean Stand Error
Standing long jump pre (m)	1.9	0.3	0.0
Standing long jump post (m)	2.0	0.3	0.0
Push up pre (time)	17.0	6.9	1.4
Push up post (time)	17.4	5.9	1.2
Abdominal pre (time)	37.5	11.6	2.3
Abdominal post (time)	41.0	13.8	2.7

Table 10 shows descriptive data on the difference between the first and second test results of the lower leg limbs, upper limb forces, and abdominal muscle strength. Specifically, the difference between the results of the first and second tests of the lower leg limbs presents the following values: mean -0.06 times, standard deviation 0.20 times and standard error of 0.03 times average (p = 0.05). Meanwhile, the difference between the results of the first and second tests of upper limb forces is the following: the mean -0.32 times, the standard deviation 7.85 times and the standard error of 1.57 times (p = 0.84). Also, we have presented the results of the difference between the first and the second results of the abdominal muscle strength, which presents these values: mean -3.50 times, standard deviation 6.78 times and average standard error 1.33 times (p = 0.01).

Table 10.

Descriptive chart of the difference between the results of the first and second tests of lower leg limbs, force of upper limbs and abdominal muscle strength.

	Mean	Dev Standard	Mean st Err	95% Diff IC		t	Sig. (2-tailed)
				Lower	Upper		
Standing long jump pre (m)- Standing long jump post (m)	-0.06	0.20	0.03	-0.12	0.01	**-1.87**	**0.05**
Push up pre (time)- Push up post (time)	-0.32	7.85	1.57	-3.56	2.92	-0.20	0.84
Abdominal pre (time) - Abdominal post (time)	-3.50	6.78	1.33	-6.24	-0.76	**-2.63**	**0.01**

Discussion

In this scientific research, we focused on young players under the age of 15 (U15) in two football teams in Shkodra where we noticed the changes during the period from the preparation to the end of the first competitive period (5 months). Monitoring the physical readiness parameters in the youth age group is an important part of the training process, as it is an important period of physical development.The purpose of this study was to investigate changes in the performance of motor skills such as the speed of linear running, skillfulness (agility), strength and cardiorespiratory fitness during the soccer season for young players from category U15. In this study the aim was to make comparisons with the results obtained, conclusions from several authors on the differences in the skill performance were taken into account.The results for this monitoring period show that players have had the following changes:

Specifically, the difference between the results of the second anthropomorphic measurements with the first is presented in the following values: weight average weight 3.5 kg, average height rate 3.5 cm, BMI growth average 0.6 m / kg2, average reduction in fat percentage 1.00 mm (standard deviation 1.29 mm and standard error of 0.53 mm average ($p = 0.12$). The length and weight gain of young players during puberty is similar to that of the general population. The only difference commonly found in body composition is that soccer players tend to be less body fat than the average of young people (Baxter-Jones, A & Helms, P, 1996; Hansen, L et al., 1999).

Testimony of how the body composition of young players contributes to their ability to succeed in football is not fully consistent, but there is some evidence that players who are more advanced in terms of morphological growth have priority in the selection processes (Gil , S, et al., 2007; Panfil,R et al.,1997).

It is also widely known that players born shortly after cut-off dates are more likely to be identified as more talented than their "co-peers" who may have been born almost a year later (Baxter-Jones , A & Helms, P, 1994; Helsen, W et al., 2005).

Also, we have presented the results of the difference between the results of the second measurement of the pulse with the first measured in 1 minute in silence, which represents its mean decrease value in 0.64 beats.

The difference between the results of the first and second tests of the average speed of 10 m is -0.26 s, at a speed of 30 m in the mean value of -0.18 s, the agility represents the mean value at -1.24 s. aerobic endurance averages -26.6 m.

For the strength skills measured in the study, the difference between the results of the first two tests of the force of the lower limbs on the average is 0.06 times, the upper limb force at 0.32 times the average of the abdominal muscle force in Average value 3.50 times. The most important variables for measuring performance in football are physical ability and technical and tactical performance (Rosch, D, et al., 2000). The physical condition of football players is usually measured in terms of sustainability, speed, strength and power (Hoff, J, 2005). It is relatively easy to prove the physical ability of young players, but it is a more challenging task to distinguish the effects of soccer training and growth-mediated development. In other words, changes in body size, functional capacity and motor skills are very individual during puberty and the existing performance of a certain player is often closely related to their maturity status (Malina, RM, et al. , 2005; Philippaerts, R, et al., 2006). In the same line are our monitoring results as well as the respective changes to the new football players in the city of Shkodra.

In football, there is demand for football players in terms of fitness readiness requirements to produce energy, explosiveness, speed, skill, balance (balance), body stability, flexibility, and an adequate level of sustainability (Bloomfield, Jet al. 2007; Helgerud, Jet et al., 2001; Krustrup, P et al., 2005).

Maintaining a high level of these components throughout the season is necessary for achieving consistent quality performance, while the basis for these individual player components is built during the teenage years. Aerobic capacity is an important factor, which in addition to the quality of the game itself, ultimately affects the final position of the teams in the championship (Hoff, J, 2005; Impellizzeri, F.M et al., 2005). Moreover, aerobic capacity has beneficial effects on parameters such as total time spent on high-intensity activities during the game, number of sprints, and number of contacts with the ball during the match. High aerobic capacity also increases the recovery from high intensity band loads (Bangsbo, J, 1993; Svensson, M & Drust, B, 2005). In the results of the difference between the second and the first measurements there is no noticeable statistical improvement in the meters during the performance of the aerobic endurance test. The improvement is only 26.6 m ($p = 0.63$) but not statistically significant.

The components of anaerobic capacity have the greatest impact on the final outcome of the match and are characterized by repeated high intensity activity. The number of these high-intensity activities during the match falls in the range of 150-250 (Bangsbo, J et al., 2007) and includes acceleration, maximum speed, and skillfulness (Gambetta, V, 1996). It is essential that these skills be stimulated and maintained continuously throughout the training process. Our monitoring results show a statistically significant improvement in speed and agility where it is worth mentioning serious work during the training phase with these ages.Sports coaches and scientists can analyze the factors that affect athletic performance (health, genetic predisposition or how the player works in the training process) to provide useful information about the strengths and weaknesses of young players. Sienkiewicz-Dianzenza, et al., 2009 in their study found significant effects ($p <0.001$) of the pre-season period at maximum speed during a 50m test test with soccer players. The authors noted an improvement of more than 5.13% at the maximum running speed. On the other hand, the effect of a seasonal training period in our study showed significant changes in the linear running speed at the beginning (10m $t2\text{-}t1 = 0.26 \pm 0.26$ s) and 30m $t2\text{-} t1 = 0.18 \pm 0.37$ s).

This can be explained by the fact that this component was particularly stimulated during training sessions from the respective coaches in Shkodra city. The aspects of the game, the movement games and the rapid change of directional speed in a small space were emphasized during the training.

Caldwell and Peters (2009) found massive (slow) improvements to the players for the 15m sprint in the middle of the season (2.44 ± 0.10s) than at the start of the competitive season (2.49 ± 0.10s), Which is at odds with our results where players improve significantly compared to the start of the competitive period. These differences may indicate a different adaptation to the training load during the training period between adults and young players. An important change in the speed and agility component appeared during the monitoring period, which may be because of the greater number of adaptation initiatives (more matches) during the competitive period or the morphological changes in the body of the player (increase of Body height, highest percentage of body mass), which may positively affect a player's motor skills (extended walking pace, increased lower extremity muscle output, etc.). Ostojic (Ostojic, S.M, 2003) found significant improvement (12.6 ± 3.3%) at the linear running speed of 50 m for most players. Significant improvement (11.7 ± 2.68%) at 35 m linear velocity during the competitive period was observed in most of the adult players of the Greek league (Bekris, E et al., 2016).

Aziz et al. (Aziz, A.R et al., 2006) reported the best running results for 20 m adults in Singapore at the end of the competing period (2.95 ± 0.09 s) compared to the start of the competing period (3.01 ± 0.10 s). These authors suggest that the training program and the loads during the season are responsible for these results. Moreover, it was confirmed that during the competitive period, players had lowered body fat levels, which affect speed and VO2max. Changes in the running speed between the season were also observed by Wislof et al. (Wisløff, U et al., 2004), which revealed that during the season the level of ability of sprinting adult players was 1.82 ± 0.3 s for 10 m, 3.0 ± 0.3 s for 20 m and 4.0 ± 0.2 s for 30 m.

Biological maturation exercises are an important influence on speed, strength and power in youth categories. Wilmore and Costill (Wilmore, J.H & Costill, D.L, 1994) suggested that expression of childhood and adolescent strength relies on mylinic motor nerves and mature maturation that is not complete until sexual maturation is achieved. The muscular strength in the lower limbs increases up to 50% between the ages of 11 and 15 at boys. Progressive growth occurs between 12 and 14 years of age (Degache, F et al., 2010).

We play an important role in improving the speed of these groups by using specific exercises to improve coordination and running technique. A frequent phenomenon in the training of this age group is the use of a range of racing between the zones, which can result in stimulation and then with the improvement of speed.

One of the biggest differences in agility compared to linear speed is that the player learns to anticipate the next move (Pearson, A, 2001), which is an essential part of quality performance during a football match. Caldwell and Peters (Caldwell, BP & Peters, DM, 2009) reported in their study significant improvements in the ability to change fast running speeds at the end of the training period (t2 = 14.76 ± 0.38 s) compared with the start (T1 = 14.97 ± 0.38 s). This is also confirmed by our research, where players at the end of the pre-season training period showed much better results than at the beginning.

We have noticed that the pre-season period had the highest effect on players 'aerobic capacity, where we recorded an increase in players' performance. We attribute this use of interval games to the training and competition process of players who, after initial measurements, wanted to offer better performance and to be the best in the team. Casajús (Casajús, JA, 2001) reported an increase in VO2max through increased running routine trials on adult players in a superior Spanish league since the beginning of the competitive period (50.2 ± 8.0 ml • kg -1 • min- 1) up to the middle of the season (52.7 ± 8.5 ml • kg -1 • min -1), but this change was not significant.

According to him, players probably reached their VO2max at the beginning of the season, and therefore it was difficult to raise that level further during the season. Achieving such a high level at the start of the season may be due to season-oriented aerobic training, which is designed to improve the aerobic element of the players. In other studies (Bangsbo, J, 1993; Haritonidis, K et al., 2004), an increase in aerobic endurance was reported at the beginning of the season by the middle of the season, which then decreased, although it was not important .

In our research, during the season (t2-t1) we did not notice any further improvements in aerobic capacity A partial (not significant) increase, however not significant, was observed in our study and at the end of the competitive period (t2).

Previous research has suggested that different physical performance characteristics become apparent in different age groups. Sprinting ability is likely to be more important in football during early puberty than later when the growth-related differences are equated. Gravina et al. (Gravina, L, 2008) found that sprint speed was the most important physiological factor associated with players between the ages of 10 and 14 being selected for the first teams. Vaeyens et al. (Vaeyens, R, et al., 2006) also found that speed was one of the factors that discriminated between elite and nun elite players at the age of 13 and 14, while aerobic endurance was more important in discrimination among 15 year olds 16 years old. The development of the strength of football players during puberty is less studied than speed or stamina, but observations suggest that football players have a higher average strength compared to the average population during puberty (Baxter-Jones, A & Helms , P, 1996; Capranica, L et al., 1992).

Unlike most other countries, football is not a fully professional game in Albania. This is one of the reasons why youth football in Albania is seen mainly as a recreational activity at young ages. In addition, for the last 10 years, the competitive system in Albanian football for the 15 year old age group is based on the philosophy "All sports". The philosophy "All sports" emphasizes every child's right to participate in sports, unlike a more competitive approach used in previous decades. In this study, player performance skills were improving. Therefore, the results of this study are not directly comparable to those reported by previous studies in professional football clubs involving only talented players.

However, training in football clubs in Shkodra has the same universal purpose as any other country: to maximize the performance level of each individual player - despite their predictive potential in the future. According to Philippaerts et al. (Philippaerts, R et al., 2006) limb movement velocity, trunk strength, upper body muscular endurance, explosive strength, speed of rotation, ability, cardio-respiratory endurance and anaerobic capacity have shown peak development at peak height and weight gain, which occurred at the age of 13.8 to young Flamande football players.

General data for teenage boys suggests a slightly different pattern, such that the velocity reaches maximum development before the peak height of the peak, the maximum aerobic power is achieved at the same time as the height peak stroke, followed by force and power after that (Beunen, G & Malina, RM, 1988; Malina, RM et al., 2004).

It is possible that the development of sustainability, speed and skills is related to the development of the nervous system, mediated by hormonal changes, because testosterone promotes nerve growth, mylination, axonal passage speed, and red blood cell production (McCullagh, E & Jones, T, 1941; Sakai, H & Woody, CD, 1988; Stocker, S et al., 1994). In addition to testosterone-mediated changes, the development of second stage strength is likely to be related to muscle growth and the increase in the amount of strength training reported in team training records. Although the improvement of the physical skills of football players was better, with the exception of aerobic capacity, before the age of 15, there is a tendency for differences between players and other teams of the same age.

It also seems that the biggest difference was found in the agility and speed performance when the results were considered in their entirety. These results can be explained by the nature of the game and the team training phase. It was logical that the power of football players would vary greatly because muscle size during growth was largely determined by the hormonal environment (Matos, N & Winsley, R, 2007) and without specific training of force, the development of strength is closely related to Chronological age (Blimkie, C, 1989). The observed difference in skill and strength performance was also expected, as these skills are constantly emphasized in football and players also gain continuous practice in these skills (Kaplan, T et al., 2009; Baxter-Jones, A & Helms, P , 1994; Bangsbo, J, 1996).

Conclusions

The results of the study showed the impact of training load at different stages of the training cycle for linear running speed, changes in speed, strength, and aerobic capacity to new football players in Shkodra.

These results can serve as a basis for comparisons with colleagues in similar research studies. We have noticed that the speed performance and the ability to quickly change the direction of the players have improved throughout the observation period. For aerobic capacity, we did not notice a major improvement during the pre-season training period, while at the end of the season, sustainability increased slightly. We conclude that the training process in the youth plays an important role in the development of young players and positively influences the development of individual athletic performance components. The study can help sports practice for clinics, fitness trainers, soccer coaches and physiotherapy coaches by comparing these results with other groups.

Practical implications

These findings highlight the need for long-term training programs with proper timing for strength, speed and aerobic capacity to maximize player potential. Special attention is recommended to be placed on aerobic capacity training, as it seems that the normal training of football does not provide sufficient stimulus for the optimal development of this ability.

However, although training under the current philosophy is not fully optimized, playing in a regional football team seems to offer enough motivation to train players to gain physical levels that is not a limiting factor to reach the level needed in elite football.

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