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Original research article

COMPLEX TRAINING AND SPRINT ABILITIES OF YOUNG BASKETBALL PLAYERS

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Abstract. *The aim of this study was to determine the effects of complex training (a combination of weight training and biomechanically similar plyometric jumps) on the sprint abilities. Young basketball players (N=31, Age=17-18) from OKK "Konstantin" and OKK "Junior" from Nis were divided into two groups: the experimental group (E, n = 16; AVIS = 186,17cm ± 6,50cm; AMAS = 74,75 ± 9,48kg) and control group (K; n = 15; AVIS = 185,15 ± 9,10cm; AMAS = 79,23 ± 11,87kg). The experimental group (E) was made up of the players from basketball team OKK "Konstantin", which in addition to basketball trainings also took part in complex training. The control group (K) was made up of the players from basketball team OKK "Junior", who at that time only took part in basketball trainings. To assess their sprint abilities, three tests were used: the 10x5m Shuttle Test (10x5m), Sprint Fatigue Test (SFT) and Sprint Speed at 15m (S15m). The measurement was done with the help of the photocell "MICROGATE", a parameter which was monitored and the processed time was read in 1/100sec. The experimental program lasted for 12 weeks (2x per week). Data processing was carried out using the SPSS statistical program. To determine the effect of complex training on the sprint abilities of young basketball players, the analysis of covariance ANCOVA was used. The results showed that group E achieved significantly greater progress than group K on the tests: 10x5m and S15m. There was no difference between group E and K on the test SFT. Based on these results we concluded that complex training has positive effects on the development of sprint abilities, as well as on the development of the capacity of changes of direction after a full sprint in young basketball players. However, the aforementioned training method does not lead to improvements in sprint endurance, i.e. it does not lead to an improved index of fatigue.*

Key words: *complex training, abilities, basketball, young players.*

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INTRODUCTION

Complex training is defined as a combination of traditional resistance training (heavy loads) and plyometric exercises (light loads) in one set (Baker, 2003; Jensen & Ebben, 2003; Dodd & Alvar, 2007; Comyns, Harrison, Hennessy, & Jensen, 2007; MacDonald, Lamont, Garner, & Jackson, 2013), and it is supposed to increase the muscle power of basketball players (Santos & Janeira, 2008). In particular, complex training combines alternating, biomechanically similar and high intensity exercises with weights and plyometric exercises, series after series during the same training session (Ebben & Blackard, 1997; Ebben, 2002). Using heavier load before a workout with lower load leads to better activation and preparation for maximum effort in similar exercises with a small load (Duthie, Young, & Aitken, 2002). By alternating mastering of large and small external load, it is possible to produce better nerve-muscle adaptations (Sale, 2002). Weight training and Plyometric training, if you look historically, have always been a complement to each other (Ebben & Watts, 1998). One of the most interesting innovations of training in the twentieth century was plyometric training (Radcliffe & Farentinos, 2003). On the other hand, as early as in the 1970s it was generally accepted that a properly planned program of weight training does not slow down nor restrict movements of the joints, but can even improve them - contributing to an increase in power (deVries, 1976). In the early eighties, it was concluded that *complex training* gives better results than just weight training (Radcliffe & Farentinos, 2003; Radovanović & Ignjatović, 2009). Basketball, initially a slow activity with the ball, grew into a very dynamic activity. Fast actions are characteristics of today's basketball game (Kocić & Berić, 2015). In men's professional basketball, during the game, a player makes acceleration (1-2sec) at 105 ± 52 times (Castagna, Chaouachi, Rampinini, Chamari, & Impellizzeri, 2009). For the mentioned reasons, the ability to accelerate is one of the most important motor skills in basketball. Speed is a multidimensional motor ability which is mainly manifested in four forms: latent time of motor reaction, the speed of individual movement, the speed of frequency movements, sprinting speed (Stojiljković, 2003). In sport practice, these forms of speed are usually manifested complexly and determine the so-called *speed potential of the individual*, in the appropriate motor activity (Željaskov, 2004). In addition, it is very important that players have a good sprint, and that they can perform it more times on the same level. This ability, which stems from the ability to produce energy by anaerobic metabolic pathways, is called speed-endurance. Athletes with poor endurance, due to fatigue cannot perform a sprint at the same level throughout the competition (Dintiman, 2010). Another sprint ability which is very important for basketball is the speed of changes of direction after a full sprint - agility (Lehnert, Hůlka, Malý, Fohler, & Zahálka, 2013; Nikolić, Kocić, Berić, & Jezdimirović, 2015). Motor structures of this type are very common in the game, since, due to changes in the situation, the players are required to start quickly, to run fast and change direction as well as to stop quickly (Jovanović, 1999). There are studies that show that complex training can have positive effects on the motor skills of basketball players (Cheng, Lin, & Lin, 2003; Santos & Janeira, 2008; Kukrić, Karalejić, Petrović, & Jakovljević, 2009; Kukric, Karalejić, Jakovljević, Petrović, & Mandić, 2012; Javorac, 2012; Adibpour, Bakht, & Behpour, 2012; Nageswaran, 2014; Roden, Lambson, & DeBeliso, 2014). Former research has mostly studied the effects of the above-mentioned training on the explosive power of basketball players. There are studies which prove that complex training has positive effects on the sprint abilities of football players (Rahimi, Arshadi, Behpur, Boroujerdi-Sadeghi, & Rahimi, 2006), handball players (Marques & Gonzales-Badillo, 2006) as well as on the students of the Faculty of Sport (Alves, Rebelo, Abrantes, & Sampaio, 2010). However, the number of studies that focused on the effects of this training method on the sprint abilities of young basketball players is rather small. We found no studies that explored the effects of complex training on sprint in basketball players. However, there are studies that show that plyometric training can contribute to improving the speed. Draganović & Marković (2011) and Asadi (2013a) working with a sample of male basketball players and Chaudhary & Jhajharia (2010) and Benis, Rossi, Russo, & La Torre (2015) working with a sample of female basketball players, found that plyometric training for a period of 6 to 8 weeks (2x a week) leads to a significant improvement of results in the 20m sprint. Bavli (2012a) working with a sample of male basketball players, Bavli (2012b) working with a mixed sample of basketball players.

The aim of this study was to determine the effects of a 12-week program of *complex training* on the sprint abilities of young basketball players.

METHOD

Sample of participants

The sample of participants in this study consisted of 31 junior age basketball players from the basketball clubs OKK "Konstantin" and OKK "Junior" from Nis. The participants were divided into two groups: the experimental group (E, n = 16; AVIS = 186,17cm ± 6,50cm; AMAS = 74,75 ± 9,48kg) and control group (K; n = 15; AVIS = 185,15 ± 9,10cm; AMAS = 79,23 ± 11,87kg). *The experimental group* (*E*) consisted of basketball players of basketball team OKK "Konstantin," who in addition to the basic technical and tactical training (5x per week) also had complex training for a period of 12 weeks (2x per week). *The control group (K)* was made up of the basketball players of basketball team OKK "Junior", who at that time only had technical and tactical training (5x per week).

The measuring instruments

To assess the anthropometric characteristics, the following were used: body height (AVIS) and body mass (AMAS). Data on the anthropometric measures were not subjected to statistical analysis and were used to describe the sample of participants. To assess sprint ability, three tests were used: the 10x5m Shuttle Test (10x5m), Sprint Fatigue Test (SFT) and Sprint speed at 15m (S15m). The measurement was done with the help of the "MICROGATE" photocells, and the parameter which was monitored and processed was the time read in 1/100sec. Sprint ability estimation tests were taken from the Internet site Topend Sports: http://www.topendsports.com/testing/tests/index.htm.

The experimental procedure

The experimental program lasted for 12 weeks (2x per week). The rest between two training session was 48 hours. The experimental program started in the second half of the pre-season period for the basketball players. The first part of the preparatory period was used as basic preparation, the development of general endurance and endurance in force so the basketball players would be ready for high-intensity complex training that followed after that. The plan of the experimental program is given in Table 1.

Table 1 Plan of the experimental program

Group	Date			
	1.8.2016. - 31.8.2016.	2.9.2016.	6.9.2016. - 24.11.2016.	30.11.2016.
E	Basic preparation	Initial measuring	Experimental treatment (complex training) + technical-tactic trainings	Final measuring
K	Basic preparation	Initial measuring	Technical-tactic trainings	Final measuring

Table 2 Structure of the training program.

W	T	Exercise	Int.	Nb of repetition /jumps	Nb.of com.	Nb of ser.	P.com.	P. ex.	P. ser.
1	1	Weights Plyo	60% 1RM max	8-12 84(total)	4	4	3min	10sec	2min
	2	Weights Plyo	60% 1RM max	8-12 92(total)	4	4	3min	10sec	2min
2	3	Weights Plyo	60% 1RM max	8-12 96 (total)	4	4	3min	10sec	2min
	4	Weights Plyo	60% 1RM max	8-12 100 (total)	4	4	3min	10sec	2min
3	5	Weights Plyo	70% 1RM max	8-10 95 (total)	4	3-4	3min	5sec	2min
	6	Weights Plyo	70% 1RM max	8-10 96 (total)	4	4	3min	5sec	2min
4	7	Weights Plyo	70% 1RM max	8-10 95 (total)	4	3-4	3min	5sec	2min
	8	Weights Plyo	70% 1RM max	8-10 98 (total)	4	3-4	3min	5sec	2min
5	9	Weights Plyo	70% 1RM max	8-10 103 (total)	4	3-4	3min	5sec	2min
	10	Weights Plyo	70% 1RM max	8-10 112 (total)	4	4	3min	5sec	2min
6	11	Weights Plyo	70% 1RM max	8-10 107 (total)	4	3-4	3min	5sec	2min
	12	Weights Plyo	70% 1RM max	8-10 108 (total)	4	4	3min	5sec	2min
7	13	Weights Plyo	75% 1RM max	6-10 100 (total)	4	3-4	3min	5sec	3min
	14	Weights Plyo	75% 1RM max	6-10 102 (total)	4	3-4	3min	5sec	2min
8	15	Weights Plyo	75% 1RM max	6-10 106 (total)	4	3-4	3min	5sec	2min
	16	Weights Plyo	75% 1RM max	6-10 98 (total)	4	3-4	3min	5sec	2min
9	17	Weights Plyo	80% 1RM max	5-8 96 (total)	4	3	3min	5sec	3min
	18	Weights Plyo	80% 1RM max	5-8 90 (total)	4	3	3min	5sec	3min
10	19	Weights Plyo	75% 1RM max	6-10 106 (total)	4	3-4	3min	0sec	3min
	20	Weights Plyo	75% 1RM max	6-10 102 (total)	4	3-4	3min	5sec	2min
11	21	Weights Plyo	70% 1RM max	8-10 108 (total)	4	3-4	3min	5sec	3min
	22	Weights Plyo	70% 1RM max	8-10 102 (total)	4	3-4	3min	10sec	2min
12	23	Weights Plyo	70% 1RM max	8-10 106 (total)	4	3-4	3min	10sec	2min
	24	Weights Plyo	70% 1RM max	8-10 102 (total)	4	3-4	3min	10sec	2min

Legend: W-week; T-training; Int.-intensity; Nb. of com.-number of complexes; Nb. of ser.-number of series; P. com-pause between complexes; P. ex-pause between exercises; P. ser.-pause between series; RM-1 repetition maximum (represents the maximum load that can be transferred throughout the whole range of motions, in a controlled way and with good posture).

Each of the *complex training sessions* lasted for 90 minutes and consisted of three parts: the warm up (15min), the main part (60min) and the final part (15 minutes). The basic unit of training was a complex pair that included a combination of exercises with weights and biomechanically similar plyometric exercises in the same set. The break between two exercises within the mentioned complex ranged from 0 to 30sec. Each of the training sessions had a maximum of four complex pairs. The pause between the sets was 2min and 3min between the complexes. *The first training of the week* consisted of the following exercises with weights: squat, lunges, leg extension and calf raise. Plyometric exercises, which are paired with the exercises with weights, included the vertical jumps with one leg and both legs, and jumps in the sagittal plane. *The second training of the week* consisted of the following exercises with weights: squat, adduction on the training device or adduction when the player is on the ground, abduction on the training device or abduction when the player is on the ground and calf raise. Plyometric exercises, which were paired with these exercises with weights, included vertical jumps with a lesser extent and more jumps that are performed in the coronal plane with one leg and both legs. Table 2 gives the structure of the training program.

The intensity of the exercises with weights ranged from 60 to 80% of 1RM. Increasing of the load was done when the participant did two more repetitions, and a reduction of the load was done if he did two repetitions less than the anticipated number. The anticipated number of repetitions for 60% 1RM is from 8 to 12, for 70% 1RM is from 8 to 10, for 75% 1RM is from 6 to 10, and for 80% 1RM is from 5 to 8 repetitions. Increasing or decreasing of the load for exercises with weights ranged from 5 to 10% of the initially estimated maximum repetition (1RM). When plyometric exercises are concerned, they were performed with maximum intensity (max).

Data processing

To determine the effect of complex training on the above-mentioned abilities of basketball players, the analysis of covariance ANCOVA was used. The results obtained in the tests before the experimental treatment (initial measurement) were used as covariates in the analysis. Before we accessed the ANCOVA analysis we checked the validity of assumptions that the analysis of covariance is based on (normality of distribution, homogeneity of variance, measurement of covariates, covariate reliability, homogeneity of regression lean). Normality of distribution of the variables was tested by the Kolmogorov-Smirnov test. All statistical analyses were performed with the software SPSS version. The level of statistical significance was set at a $p<0.05$.

RESULTS

The results of the Kolmogorov-Smirnov test showed that the variables of the experimental and control groups at the initial and final measurement did not violate the presumption of normal distribution ($p>0,05$). Levene's Test of Equality of Error Variances showed that the assumption of equality of the variance is not violated ($p>0,05$). The assumption of homogeneity of regression leans is not violated for any of the variables ($p>0,05$). Based on this, we can conclude that there is no interaction between the covariate and treatment. After preliminary checks where we found that the assumptions that ANCOVA is based on are not violated, we continued with the analysis of covariance and the research into the impact.

Table 3 Univariate analysis of covariance

Test	G	N	Std. Dev. (In.)	Std. Dev. (Fin.)	Mean (In.).	Mean (Fin.)	Adj. Mean	F	p	P.Eta Squ.
10X5m	E	16	0,619	0,474	14,769	14,369	14,448	5,077	**,032**	,153
	K	15	1,278	0,581	15,789	15,002	14,918			
SFT	E	16	0,027	0,028	0,963	0,962	,970	0,163	,689	,006
	K	15	0,023	0,185	0,981	0,982	,973			
S15m	E	16	0,109	0,197	2,651	2,507	2,541	4,300	**,047**	,133
	K	15	0,176	0,036	2,725	2,682	2,646			

Legend: Std. Dev. (In.) - Standard Deviation of the initial measurement; Std. Dev. (Fin.) - Standard Deviation of the final measurement; G - group; E - experimental group; K - control group; N - number of respondents; Mean (In.) - the mean value of the initial measurement; Mean (Fin.) - the mean value of the final measurement; Adj. Mean - corrected mean values at the final measure from which the influence of covariates is statistically removed; F - the value of F-test to test the significance of differences of arithmetic means; p - coefficient of significance of differences of arithmetic means; P.Eta Squ. (Partial Eta Squared) - size of impact.

After statistically removing the impact of the results obtained on the tests for assessing *sprint performance* prior to the experimental treatment, it was found that there is a statistically significant difference at the univariate level between the participants of the E and K group, after the experimental treatment, on the test **10x5m** (F = 5,077; p = 0,032) (Table 7). Based on the revised mean values Adj.Mean (from which the influence of covariates was statistically removed) we can see that the participants of group E achieved better results (Adj.Mean = 14,448) than the participants of group K (Adj.Mean = 14,918). Based on the partial eta square (Partial Eta Squared = 0,153), we can see that there is a **great impact** (difference). According to Kohen, 0,01 is - little influence, 0,06 - medium impact, 0,14 and more - a great impact (Pallant, 2011). If Partial Eta Squared is multiplied by 100 we can see that 15.3% of the variance in the dependent variable is explained by the independent variable. A statistically significant difference at the univariate level between the participants from the E and K group, after the experimental treatment, is also present on the test **S15m** (F = 4,300; p = 0,047). Based on the revised mean values (Adj.Mean) we can see that the participants from group E achieved better results (Adj.Mean = 2,541) than participants of group K (Adj.Mean = 2,646). Based on the partial eta square (Partial Eta Squared = 0,133), we can see that there is the **mean effect** (difference). If Partial Eta Squared is multiplied by 100 we can see that 13,3% of the variance in the dependent variable is explained by the independent variable. The univariate analysis of covariance, however, shows that there is no statistically significant difference between the participants from group E and K, after the experimental treatment, on the test **SFT** (F = 0,163; p = 0,689).

DISCUSSION

The results showed that after the experimental treatment, group E achieved significantly greater progress than group K on the test S15m. This means that the complex training for a period of 12 weeks (2x per week) had a positive effect on the improvement of the results between two testings using the mentioned test. Similar results were also found by some other authors. Marques & Gonzales-Badillo (2006) working with a sample of handball players found that complex training for a period of 12 weeks can improve results in the 15m and 30m sprint. Alves, Rebelo, Abrantes, & Sampaio (2010) working with a sample of football players found that complex training for a period of 6 weeks, whether performed once or twice a week, leads to improved results in the sprint at 5 and 15m. That complex training can have a positive effect on the improvement of the results of speed was also determined by Rahimi, Arshadi, Behpur, Boroujerdi-Sadeghi, & Rahimi (2006). The authors, working with a sample of 48 students, average age 19,27 ± 1,36, who were also active in different sports, found that complex training for a period of 6 weeks (2x per week) leads to a significant improvement in angular speed during the test of 60sec on the bicycle ergometer. Alam, Pahlavāni, & Mehdipou (2012) working with a sample of handball players, and Alptekin, Kılıç, & Maviş (2013) working with a sample of football players found that plyometric training may be a suitable method that leads to a significant improvement of results for the 30m sprint. That plyometric training can improve the speed of basketball players was also confirmed by many studies (Arazi & Asadi, 2011; Bandyopadhyay, Mitra, & Gayen, 2013; Dadwal, 2013; Komal & Singh, 2013; Robert & Murugavel, 2013; Prasad & Subramainiam, 2014; Zribi et al., 2014; Abraham, 2015). Except in the case of basketball players, plyometric training also leads to the development of speed among other participants (Robinson, Devor, Merrick, & Buckworth, 2004; Kotzamanidis, 2006; Shiran, Kordi, Ziaei, Ravasi, & Mansournia, 2008). In addition to the plyometric training method, running speed can also be developed by strength training with weights or strength training without weights. Bandyopadhyay, Mitra, & Gayen (2013) working with a sample of basketball players aged 18 to 23 found that training that involves a combination of strength training with weights and strength exercises without weights for a period of 8 weeks (3 times a week/45min) leads to a significant improvement in speed. Robert & Murugavel (2013) working with a sample of basketball players aged 19 to 25 found that weight training for a period of 8 weeks (3 times a week) leads to a significant improvement in acceleration. Similar results were obtained by Rahimi, Arshadi, Behpur, Boroujerdi-Sadeghi, & Rahimi (2006). The authors, working with a sample of 48 students, average age 19,27 ± 1,36 years, who were active in different sports, found that weight training for a period of 6 weeks (2x per week) has a significant effect on improving angular speed during the test of 60sec on the bicycle ergometer. The aforementioned studies show us that sprinting could be improved both by the plyometric training method and strength training. Due to the fact that the training in our experimental treatment consists of a combination of these two methods of training, the obtained results are expected. Rahimi, Arshadi, Behpur, Boroujerdi-Sadeghi, & Rahimi (2006) found that just such a combination (complex training) has significantly greater effects on the development of angular velocity during the test of 60sec on the bicycle ergometer than plyometric training or weight training when they are used separately. There are some other studies that have shown that complex training gives statistically significant better results in the development of motor skills than plyometric training or weight training when they are used separately (Adams, O'Shea, O'Shea, & Climstein, 1992; Fatouros et al., 2000**;** Cheng, Lin & Lin, 2003; Rahimi & Behpur, 2005; Nageswaran, 2014). Improving results in sprint can be achieved when plyometric training is combined with strength training exercises without weights (Ingle, Sleap, & Tolfrey, 2006; Andrejić, 2012; Ramateerth & Kannur, 2014), as well as when weight training is combined with sprint (Tsimahidis et al., 2010). The results also show that the E group also achieved statistically significantly greater improvement than the group K on the test **10x5m**, after the experimental treatment. This means that the complex training for a period of 12 weeks (2x per week) had a positive effect on the improvement of the results from two testings using the mentioned test. This test assesses the ability to change the direction of movement after a full sprint, which in literature is called agility. We did not find many studies that deal with the effects of complex training on the ability to change the direction of movement after a full sprint. Basically, the authors investigated the effects of this training on explosive power. Alves, Rebelo, Abrantes, & Sampaio (2010) working with a sample of 23 football players, average age 17,4 ± 0,6 years, found that complex training for a period of 6 weeks, performed once or twice a week, does not lead to significant improvements in agility. The authors believe that there was no improvement of agility because in the exercise program there were no exercises that required a change of direction. All the exercises involved a combination of weight training and vertical jumps. Unlike this study, in our study we had exercises that involved jumping in the frontal plane. There are studies that have shown that the plyometric training that involves jumps in the frontal plane and plyometric training that involves jumps in the sagittal plane have different effects on the development of agility and explosive power of basketball players (King & Cipriani, 2010; McCormick et al., 2015). If we compare the value of the Partial Eta Squared between tests 10x5m (Partial Eta Squared = 0,153) and S15m (Partial Eta Squared = 0,133), we can see that complex training for a period of 12 weeks (2x per week) had a greater impact on improving test results on the test 10x5m than S15m. The results showed that there is no statistically significant difference between the E and K group, after the experimental treatment, for the SFT. This means that complex training for a period of 12 weeks (2x per week) did not improve the results of the aforementioned test. If we look at the description of this test we can see that this is a test of repeated sprints and it is used to assess the durability of the sprint. The result that is obtained with the aid of this test is referred to as the fatigue index. According to the recommendations contained on the site *Topend Sports*, from which this test is taken, the index value of fatigue usually ranges from 75 to 95%, and the ranking of the results is as follows: less than 80% - poor results; 80 to 84% - average results; from 85 to 89% - good results; more than 89% - excellent results. The index of fatigue at the initial measurement of the E (fatigue index = 96,3%) and K (fatigue index = 98,1%) group had a high - excellent value. This shows that there was not much room for improvement during the experimental treatments. We have already mentioned that the experimental treatment began after basic training which aimed to develop general endurance, muscle endurance, anaerobic endurance, so that the basketball players of group E would be fully prepared for high-intensity complex training. It is possible that such training has contributed to improving the fatigue index for the mentioned values before the experimental treatment. The basketball players from group K also had a similar basic preparation. Similar results have also been found by Cheng, Lin, & Lin (2003) for a sample of basketball players aged 16 to 19. The authors found that complex training for a period of 8 weeks (3 times a week) does not lead to improved endurance. On the other hand, Urtado, Leite, Gimenes, & Assumpção (2012), working with a sample of 14 basketball players, average age 13,28 ± 0,63 years, found that plyometric training for a period of 8 weeks (3 times a week) leads to a significant improvement in the fatigue index (2%). Similar results were obtained by Shiran, Kordi, Ziaei, Ravasi, & Mansournia (2008) for a sample of wrestlers and found that plyometric training can reduce the rate of fatigue. In addition to the fact that plyometric training can have an effect on improving anaerobic endurance, there are studies that prove that this method of training has positive effects on the development of aerobic endurance (Raj, 2013; Komal & Singh, 2013; Abraham, 2015). We believe that the effects of complex training on the results of this test would be different if there was no basic preparation before the initial measurement and experimental treatments, but such an approach would represent a great risk of injury to young players, and such a practice is not recommended.

CONCLUSION

The results of this research showed that complex training for a period of 12 weeks (2x per week) has positive effects on the development of sprint abilities, as well as the development of the capacity of changes of direction after a full sprint among young basketball players. The results also showed that the mentioned training does not lead to improvements in sprint endurance, i.e. that it does not lead to an improved fatigue index. Based on these results, we can conclude that complex training is a suitable method that fitness trainers can use in their work with young basketball players, with the aim of improving motor skills important for this sport. However, before applying this method, it is important to carry out the basic preparation and develop muscular endurance in order not to overload. It is necessary to adapt the training to the biological growth and development of young basketball players.

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KOMPLEKSNI TRENING I SPRINT SPOSOBNOSTI MLADIH KOŠARKAŠA

Cilj ovog istraživanja bio je da se utvrde efekti kompleksnog treninga (kombinacija vežbi sa tegovima i biomehanički sličnih pliometrijskih skokova) na sprint sposobnosti mladih košarkaša. Uzorak ispitanika činio je 31 košarkaš juniorskog uzrasta košarkaških klubova OKK "Konstantin" i OKK "Junior" iz Niša. Ispitanici su podeljeni na dve grupe: eksperimentalnu grupu (E; n=16; AVIS=186.17cm±6.50cm; AMAS= 74.75±9.48kg) i kontrolnu grupu (K; n=15; AVIS=185.15±9.10cm; AMAS= 79.23±11.87kg). Eksperimentalnu grupu (E) činili su igrači košarkaškog kluba OKK "Konstantin", koji su pored tehničko-taktičkih treninga imali i kompleksne treninge. Kontrolnu grupu (K) činili su igrači košarkaškog kluba OKK "Junior", koji su u tom periodu imali samo tehničko-taktičke treninge. Za procenu sprint sposobnosti korišćena su tri testa: 10h5m Shuttle Test (10X5m), Sprint fatigue test (SFT) i Sprinterska brzina na 15m (S15m). Merenje je vršeno uz pomoć foto ćelija "MICROGATE", a parametar koji je praćen i obrađen je vreme očitavano u 1/100sec. Eksperimentalni program, koji podrazumeva primenu kompleksnog treninga, trajao je 12 nedelja (2x nedeljno). Obrada podataka vršena je programom za statistiku SPSS. Za utvrđivanje efekta komkpleksnog treninga na sprint sposobnosti mladih košarkaša korišćena je analiza kovarijanse ANKOVA. Rezultati su pokazali da je E grupa ostvarila statistički značajno veći napredak od K grupe na testovima: 10X5m i S15m. Nije bilo razlike između E i K na testu SFT. Na osnovu ovakvih rezultata zaključili smo da kompleksni trening u trajanju od 12 nedelja (2x nedeljno) ima pozitivne efekte na razvoj sposobnosti sprintanja, kao i na razvoj sposobnosti promene pravca kretanja nakon punog sprinta kod mladih košarkaša. Međutim, pomenuti trenažni metod ne dovodi do poboljšanja sprinterske izdržljivosti, odnosno ne dovodi do poboljšanja fatigue index-a.

Ključne reči: *kompleksni trening, sprint sposobnosti, košarka, brzina, fizička priprema*