

The Strength of Kicking the Ball after Preparation Period with U15 Football Players

Jovan Gardasevic, Dusko Bjelica and Ivan Vasiljevic

University of Montenegro, Faculty for Sport and Physical Education, Niksic, Montenegro

ABSTRACT

The main aim of the research was to identify a level of quantitative changes of the strength of kicking the ball with fifteen years old football players under the influence of the programmed football training of a six weeks' preparation period. The training programme covered forty-four training units. The research was made on a sample of 120 cadet level football players. To estimate the strength of kicking the ball three tests have been used: the strength of kicking the ball with foot, ball on the ground, the strength of kicking the ball with foot, ball in the air, the strength of kicking the ball with head. In the area of comparative statistics, we used discriminant parametric procedure t-test for big paired samples. It can be concluded that there are statistically significant differences in all three variables to estimate the strength of kicking the ball. This confirmed the hypothesis that the expected significant positive quantitative changes of situational-motor abilities influenced by the proposed model of training in preparation period with fifteen years old football players. The authors were guided by the fact that this kind of training program in preparation period is very effective in terms of raising the strength of kicking the ball level with fifteen years old. The obtained results can be directed towards innovation plans and programs in the preparation period, and the adaptation of the same needs of the respective population.

Key words: football, effects preparation period, strength of kicking the ball

Introduction

Football is a sport that is characterized by numerous and varied complex dynamic kinesiology activities that are characterized by a large number of cyclic and acyclic movements (Gardasevic & Bjelica, 2013). It is evident that all four moments of play, possession of the ball, the opponent's possession of it, the transformation after winning the ball and the transformation after losing the ball depends on the ability of players to perform certain movements of varying intensity, in different directions and the different sections of the field (Gardasevic & Bjelica, 2014). They must have developed basic and specific motor abilities (Gardasevic, Bjelica & Popović, 2015). One of the situational motor skills, which should be at a high level, is a strength of kicking the ball.

Most of the elements in football game, especially those with the ball, are very complex. For their improvement and impeccable application in the game, it is necessary first to have the whole motor preparations. The physical strength has a great importance in football (Gardasevic & Goranovic, 2011). A specific strength with football player is reflected by the strength reflection while jumping, the pushing strength with sprint, strength of stopping and pushing while changing the moving direction, strength of kicking by foot and with a head, strength of throwing the ball with a hand, stability on the ground and in the air, in duels (Gardasevic, 2010). One of the factors that affect the strength is the football players is their age. In child's development, the strength increases with increasing a muscle size. Psychomotor strength, primarily static and repetitive, according to some authors is 50% innate, and systematic training can have a significant effect on it (Gardasevic, Bjelica, Milasinovic, & Vasiljevic, 2016).

The main objective of this study was to determine the level of quantitative changes of strength of kicking the ball in football cadet level, under the influence of a programmed football training which included one preparatory period of forty-two days.

Methods

This was a longitudinal study with an aim that in the two time-varying points determine quantitative changes of strength of kicking the ball in football cadet level (15 year±6 months) under the influence of programmed training process, which included a summer preparation period for the competition season in a unique cadet league of Montenegro and the cadet league middle region of Montenegro. The training program lasted 42 days and was carried out on the auxiliary football field of FC Sutjeska Niksic. The training program included 44 trainer units, within which 8 friendly matches were played.

For data processing only the results of those respondents who have undergone a complete program of work and who have joined the initial and final measurement are taken. This study included a sample of 120 young cadet football players of 4 teams, all from Niksic. Before programmed work all respondents had passed medical check-ups to make sure they could access the training process. When selecting the instruments (tests) it was taken into account that they meet the basic metric characteristics, which means the appropriate age and objective material and spatial conditions. For the assessment of strength of kicking the ball the following tests were used (Gardasevic, 2010; Gardasevic & Bjelica, 2012): 1. The strength of kicking the ball with foot, ball on the ground (SKBG), 2. The strength

of kicking the ball with foot, ball in the air (SKBA), 3. the strength of kicking the ball with head (SKBH).

Considering that these are a cadet age players (15-year-olds±6 months), in a sensitive period of psychophysical development, program is tailored specifically to their age, taking into account the time spent in the previous training process. Time structure of the training ranged from 60 to 120 minutes, depending on the goals and objectives of the training unit and it was divided into 3 phases:

- Introductory-preparatory part (25-30% of the duration of training)
- The main part (60-65% of the duration of the training)
- The final part (up to 10% of the duration of training)

In the introductory-preparatory part of the training the emphasis was on raising the operating temperature in children. As a tools some various elementary games with a ball were used that enabled work on the elementary basics of technique and tactics, also the various polygons with exercises coordination were used. A variety of games and exercises to increase joint mobility and strengthen muscles also applied at this stage.

At the first stage of the main part of the training the intensity is slightly increased compared to the warm-up phase and the training program was implemented through a variety of ball games. With a game method, the respondents were taught and practiced football skills through a large number of repetitions. At the second stage of the main part of the training the players mostly had a free game on two goals that allowed them some creative activities and highlight of individual, imagination, independent thinking and hard work, applying the elements that teach by the method of the game from the first stage of the main part, and thus strengthening the willing quality. At this stage of the training the intensity was the greatest. At the final

part of the training the task was lowering the physiological curve to an optimum level, and low-intensity activities were used: stretching and relaxation exercises, competitive game of penalty kicks, free kicks.

Data obtained from the survey were analyzed using descriptive and comparative statistics. In the area of descriptive statistics for each variable both in the initial and the final state central and dispersion parameters were processed as well as measures of asymmetry and flatness. The hypothesis of normal distribution of results was tested on the basis of Kolmogorov and Smirnov test. In the area of comparative statistics, to determine differences in the variables used to estimate the strength of kicking the ball at the start (initial state) and at the end (final state) of the training program in the preparation period, we used the discriminative parametric procedure Student's t-test for large dependent samples.

Results

In Tables 1 and 2 are shown the basic descriptive statistical parameters of variables for estimations of the strength of kicking the ball in the initial and final measurement, where the values of central and dispersion tendency were calculated: arithmetic mean (Mean), standard deviation (Std. Dev.), standard error of arithmetic mean (Std. Error), the coefficient of variation (CV%), minimum (Minimum) and maximum (Maximum) values, the range of results (Range), the curvature coefficient (Skewness) and elongation (Kurtosis), as well as the values of Kolmogorov and Smirnov test (K-S test).

First the central and dispersion parameter of variables for assessing strength of kicking the ball in the initial state were analysed (Table 1).

Table 1. Central and dispersion parameter of variables for assessing strength of kicking the ball in the initial state

No.	Variables	Mean	Std. Dev.	Std. Error	CV%	Mini-mum	Maxi-mum	Range	Skew-ness	Kurto-sis	K-S test
1.	SKBGI	13.66	2.83	0.26	20.72	7	20	13	0.02	-0.42	0.08
2.	SKBAI	11.21	2.32	0.21	20.72	7	16	9	0.03	-0.96	0.02
3.	SKBHI	7.19	1.15	0.11	16.03	5.10	9.40	4.30	0.27	-0.85	0.32

Legend: SKBGI - The strength of kicking the ball with foot, ball on the ground initial state; SKBAI - The strength of kicking the ball with foot, ball in the air initial state; SKBHI - The strength of kicking the ball with head initial state

By analysing central and dispersion parameter of variables for assessing strength of kicking the ball in the initial state – values of Kolmogorov and Smirnov test shows that the results are normally distributed. The coefficient of variation and range have a little higher value, but still the results belong to homogenous sets. Slightly positive values of skewness in two variables, the strength of kicking the ball with foot, ball on the ground (SKBG) and the strength of kicking the ball with foot,

ball in the air (SKBA), are showing that the results have minimum lean to the side of the weak, it is almost perfect symmetry. The values of kurtosis indicate a slight curvature of the curve distribution of results and a slight scattering of results.

Central and dispersion parameters of variables for estimation of the strength of kicking the ball in the final measurement showed the following values (Table 2)

Table 2. Central and dispersive parameters of variables for estimation of the strength of kicking the ball in the final state

No.	Variables	Mean	Std. Dev.	Std. Error	CV%	Mini-mum	Maxi-mum	Range	Skew-ness	Kurto-sis	K-S test
1.	SKBGF	18.62	2.80	0.26	15.02	14	25	11	0.19	-0.83	0.07
2.	SKBAF	15.96	2.44	0.22	15.31	11	21	10	-0.14	-0.84	0.02
3.	SKBHF	8.02	1.12	0.10	13.96	6.10	10.10	4	0.31	-0.97	0.14

Legend: SKBGF - The strength of kicking the ball with foot, ball on the ground final state; SKBAF - The strength of kicking the ball with foot, ball in the air final state; SKBHF - The strength of kicking the ball with head final state

By analyzing the central and dispersive parameters of variables for estimation of the strength of kicking the ball in the final state – it is visible that the results are improved comparing to the initial state, that are quite homogeneous with respect to

the initial state even though the range of scores in the variables is still a quite large. Skewness and kurtosis values are in the range of - 1 to + 1, which means that there is no statistically significant tilt angle and elongation compared to the normal

distribution. The values of Kolmogorov and Smirnov test shows that the results are normally distributed in all three variables.

To determine the statistical significance (significance) of differences in arithmetic means (partial quantitative changes) of variables for estimation of the strength of kicking the ball, the t-

test was applied to for large dependent samples. The values of t-test were on the level of significance (Sig.) from 0.01 ($p \leq 0.01$) in all the variables for the evaluation of strength of kicking the ball. The differences of arithmetic means of the initial and the final measurement of variables for evaluating strength of kicking the ball are shown in Table 3.

Table 3. The values of t-test between the arithmetic means of the initial and the final measurement of variables for evaluating strength of kicking the ball

	Variables	Mean	Std.	Std.	Correlation	T-test	Sig.
			Deviation	Error			
Par 1	SKBGI	13.66	2.83	0.26	0.95	-60.23	0.00
	SKBGF	18.62	2.80	0.26			
Par 2	SKBAI	11.21	2.32	0.21	0.93	-58.39	0.00
	SKBAF	15.96	2.44	0.22			
Par 3	SKBHI	7.19	1.15	0.11	0.96	-27.93	0.00
	SKBHF	8.02	1.12	0.10			

Numerical value of t-test shows that also a statistically significant improvement occurred in tests for the evaluation of the strength of kicking the ball with foot, ball on the ground (SKBG) and the strength of kicking the ball with foot, ball in the air (SKBA), and by a numeric value smaller but still statistically significant improvements with respect to these two variables, with the variable the strength of kicking the ball with head (SKBH), as expected, as players of this age still have some latent fear of the hitting the ball with a head, which eventually disappears and only later show a significant improvement in this variable to estimate the strength of kicking the ball. Based on the results gained it can be noted that there are statistically significant differences in all variables for estimation of the strength of kicking the ball, and therefore can be said that there was a statistically significant positive partial effect of the training program in the preparation period, and the t-test values were significant at the reliability level $p < .01$ for all variables for estimation of the strength of kicking the ball.

Discussion

The aim of this study was to, based on the training work program of forty-two (42) days, determine the level of transformation of the strength of kicking the ball with cadet football players, under the influence of a scheduled football training that included one preparatory period. This study included a sample of 120 young cadet football players of 4 teams, all from Niksic, competing in a unique Montenegrin cadet league and in the middle region league of Montenegro. On the basis of the obtained parameters it can be concluded that the statistically sig-

nificant partial quantitative effects (changes) in all the variables for estimation of the strength of kicking the ball obtained as a result of the training program applied in the preparation period. The method of work that has been applied in this training program abounds with exercises dominated by powerful explosive movements, so that the positive transformations are not unexpected (Gardasevic, Bjelica, Vasiljevic, 2017). In this age, it comes to an increase in biological growth and development of muscles, increase of muscle cross-section, which can certainly contribute to positive results (Gardasevic, Bjelica & Vasiljevic, 2016).

Based on the results of t-test for large dependent samples, with the variables for estimation of the strength of kicking the ball the statistically significant differences were determined in all pairs of variables between the initial and final states, at the level of statistical significance (significance), $p < 0.01$. It can be concluded that the training program of work in preparation period has led to the positive transformation in all variables that were estimating, by the structure of a hypothetical setting of the models, the strength of kicking the ball. In this research, the authors were guided by the fact that such a training program of work in preparation period is a very efficient way of working in terms of raising the level of strength of kicking the ball with cadet football players. The authors conclude that the summer period of 42 days, at cadet football players, with such training work program, is optimal for lifting the strength of kicking the ball to the level required for the competition. The gained results can be directed towards innovation of plans and programs of work in the preparation period, and adjusting the same to the needs of the population concerned.

REFERENCES

- Bjelica, D. (2003). *Uticaj fudbalskog treninga na biomotorini status kadeta Crne Gore*. Doktorska disertacija. Beograd: Fakultet sporta i fizickog vaspitanja.
- Bjelica, D. (2004). Zavisnost tjelesnih sposobnosti od sportskog treninga kod populacije fudbalskih kadeta Crne Gore. *Sport Mont*, 4/II, 58-71.
- Bjelica, D. (2005). Sportski trening i njegov uticaj na antropomotoricke sposobnosti fudbalera cetnaestogodisnjaka mediteranske regije u Crnoj Gori. *Sport Mont*, 8,9/III, 26-41.
- Gardasevic, J. (2010). *Efekti programiranog rada u pripremnom periodu na transformaciju bazicno-motorickih i situaciono-motorickih sposobnosti kod fudbalera kadetskog uzrasta*. Magistarski rad. Niksic: Fakultet za sport i fizicko vaspitanje.
- Gardašević, J., & Goranović, K. (2011). Efekti programiranog rada u pripremnom periodu na transformaciju eksplozivne snage kod fudbalera kadeta. *Sport Mont*, 28,29,30/IX, 55-62.
- Gardašević, J., & Bjelica, D. (2012). Valjanost situacijsko-motoričkih testova kod fudbalera kadeta u dobi od 15 godina (U15). *Sport Mont*, 34,35,36/X, 488-493.
- Gardasevic, J., & Bjelica, D. (2013). Efekti programiranog trenaznog rada u trajanju od šest nedjelja na transformaciju fleksibilnosti kod fudbalera kadetskog uzrasta. *Sport Mont*, 37,38,39/XI, 212-217.

- Gardasevic, J., & Bjelica, D. (2014). Efekti rada u pripremnom periodu na brzinu vođenja lopte petnaestogodisnjih fudbalera. *Sport Mont*, 40,41,42/XII, 160-166.
- Gardasevic, J., Bjelica, D., & Popovic, S. (2015). Efekti programiranog rada tokom pripremnog perioda na transformaciju agilnosti kod fudbalera kadetskog uzrasta. *Sport Mont*, 43,44,45/XIII, 355-360.
- Gardasevic, J., Bjelica, D., & Vasiljevic, I. (2016). Six-Week Preparation Period and its Effects on Transformation Movement Speed with Football Players Under 16. *Sport Mont*, 14(1), 13-16.
- Gardašević, J., Bjelica, D., Milašinović, R., & Vasiljević, I. (2016). The Effects of the Training in the Preparation Period on the Repetitive Strength Transformation with Cadet Level Football Players. *Sport Mont*, 14(2), 31-33.
- Gardasevic, J., Bjelica, D., Vasiljevic, I. (2017). The strength of kicking the ball after preparation period with U15 football players. *Book of Abstracts of the 14th International Scientific Conference on Transformation Processes in Sport "Sport Performance"* (65-66), Podgorica: Montenegrin Sports Academy.

J. Gardasevic

University of Montenegro, Faculty for Sport and Physical Education, Narodne omladine bb, Niksic, Montenegro
e-mail: jovan@ac.me