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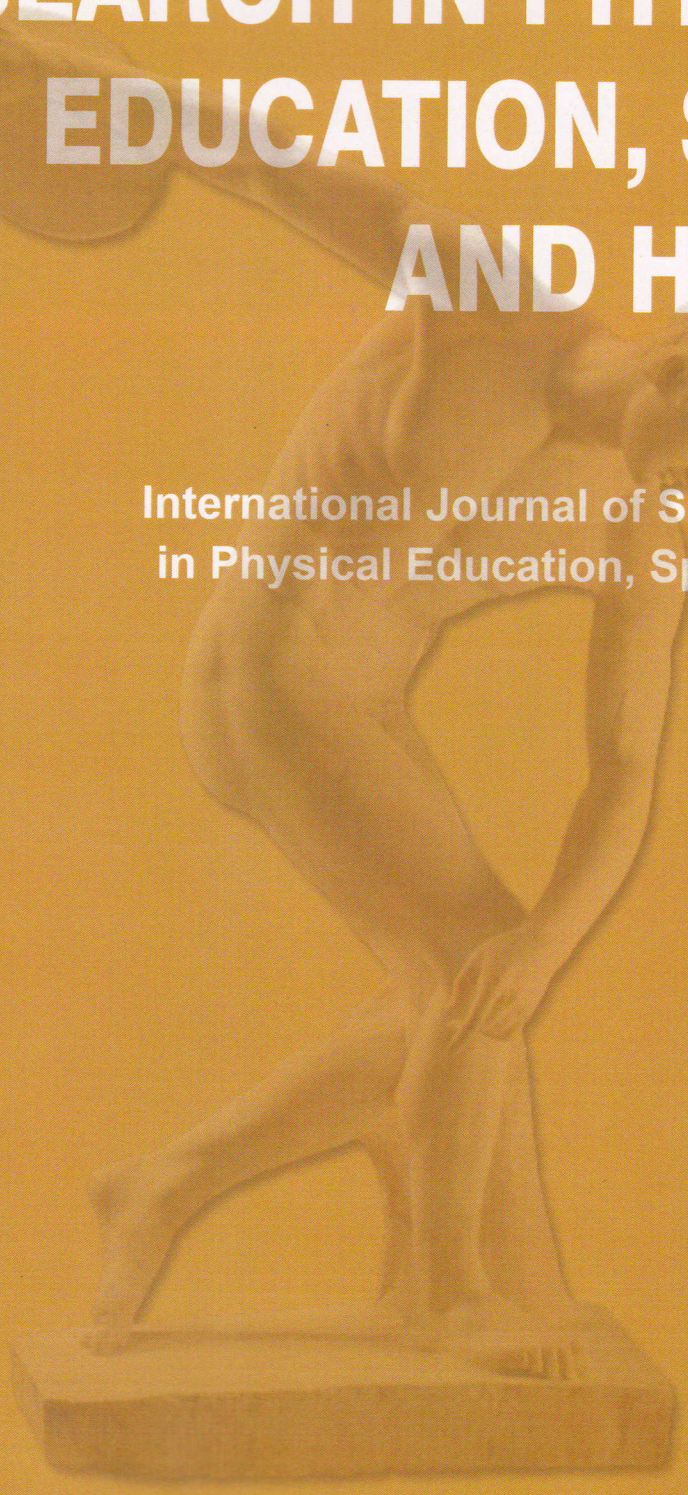

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Editorial Office: Research In Physical Education, Sport And Health, Faculty of Physical, Education, Sport and Health, Skopje, Republic of Macedonia.
str. "Dimce Mircev no.3"
Phone:+389 2 3113 654
e-mail: info@pesh.mk
e-mail: glaven.urednik@pesh.mk
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INFLUENCE OF AN ADAPTED FUNCTIONAL FOOTBALL TRAINING IN IMPROVING THE SPECIFIC-MOTORIC PERFORMANCES OF FOOTBALL PLAYERS

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Žikica Tasevski, Nebojsa Markovski, Vladimir Vuksanovikj, Borce Daskalovski, Vlatko Nedelkovski
Faculty of Physical Education, Sport, and Health, "Ss. Cyril and Methodius" University, Skopje, Macedonia

Abstract

The research was conducted on a sample of 40 football players at the age from 17 to 35 years with the basic aim to establish quantitative transformation changes of the tests for assessing the specific-motoric abilities under the influence of an adapted functional football training with top football players who play different positions in the team. For the completion our goals, six tests of assessing the specific-motoric abilities were applied as follows: zigzag running without a ball (CIK_CAK), zigzag running with a ball (CIK_CAK_T), Ajax test 5 x 10 meters without a ball (AJAKS), AJAX test 5 x 10 meters with a ball (AJAKS_T), Illinois test without a ball (ILINOIS), Illinois test with a ball (ILINOIS_T). The experimental program was being applied during six working weeks with four trainings each week. Trainings were applied with a circular method of work, and the respondents were placed in stations, divided into groups, each of two players. The research results suggest that the six-week experimental training program of an adapted functional football training had a positive effect in improving the average results with the six tests. On the base of the numerical values of arithmetic means and rated differences, it can be concluded that within a six-week period, the entire sample of respondents marked improvement with the tests: zigzag running without a ball (CIK_CAK), Ajax test 5 x 10 meters without a ball (AJAKS), Ajax test 5 x 10 meters with a ball (AJAKS_T), Illinois test without a ball (ILINOIS).

***Key Words**: football, motoric effect, measurement, functional training*

Introduction

Modern soccer requires players to demonstrate a high level of functional abilities, technical-tactical efficiency, in a word, a morphofunctional universality so that they could act in different situations of the game, often in circumstances such as lack of time, limited space and active interference by the opponent. Hence, only a good level of motor and functional abilities provides an appropriate physical condition of soccer players who effectively act in conditions of high psychophysical load during the entire period of 90 minutes of the match. Lately the functional training adapted for a specific sport is becoming increasingly popular for such preparation of soccer players. Functional training is the opposite of a classical training with devices in the gym. There are no devices in a real functional training. The props that are being used for the training include Russian kettlebells, medical balls, gymnastics hoops, ropes, elastic straps, tires, etc. Functional training also encompasses a great range of exercises that are performed only with the weight of one's own body. Functional training programmed for soccer players is considered to be the most complete way of training, because they work on all important motor characteristics: power, fitness, explosiveness, speed, and endurance. It can be said that the most useful aspects were taken from all sports and were completed in a very diverse concept. In all exercises, the idea is to include as many muscle groups as possible at the same time. Functional training is a powerful weapon that, with a good combination of exercises, activates all muscles in the body. Specifically because of the combined exercises that activate all muscles in the body, including minimum rests, this way of training is very exhausting, physically and mentally. The entire training can last from 30 to 60 minutes, and this is more than sufficient time to spend the power reserves because this method exhausts all three energy compositions (2 anaerobic and 1 aerobic).

Within the concept of a soccer game, the specially programmed functional training contains the key situational activities during a match, which include anaerobic type of work with a large number of sprints, aggressive and powerful duels of explosive character.

The general goal of the research is to establish the quantitative transformation changes with the tests of assessing the specific-motoric abilities under the influence of an adapted football functional training with top football players who play different positions in the team.

Materials and Methods

Subjects

The research was carried out on a sample of 50 soccer players between 17 and 30 years of age, who play in the Football Club "Sileks" from Kratovo. The sample was also classified according to the positions of the soccer players: goalkeepers (n = 5), defenders (n = 15), midfielders (n = 15) and strikers (n = 15). Before the start of the measurement in accordance with the Helsinki Declaration, the respondents were informed about the research objectives and the possible risks of injuries. The participation in the research was terminated if some of the respondents reported certain health problems.

Specific motoric tests

In order to assess specific-motoric abilities the following tests were applied: zigzag running without a ball (CIK_CAK_T), Ajax test 5 x 10 meters without a ball (AJAKS), Ajax test 5 x 10 meters with a ball (AJAKS_T), Illinois test without a ball (ILINOIS), Illinois test with a ball (ILINOIS_T).

Experimental training program of functional training for soccer players

The experimental program was applied within a period of six working weeks, with four trainings per week. The trainings were applied with a circular method of work, and the respondents were placed in stations, divided into groups, each of two players.

During the first two weeks, three rounds were performed at each station, with a duration of 20 seconds per station, and a break between the stations of 90 seconds. The following exercises were carried out at the stations: single leg balance on a balance panel, and with the other leg – soccer ball strike with the inner side of the foot passed by a team mate with a hand at a distance of 2-3 meters; repetitive lifting with arms of TRX straps from a semi-supine position (back); rope jumps; alternating stepping with the left and the right leg forward, under the load of an elastic strap, placed around the hips with a length of 3 meters; repetitive lifting with arms of TRX straps from a semi-supine inclined position (biceps); TRX hamstring curls; overturning a tractor tire with a weight of 70 kg from a kneeling position (quadriceps); push-ups with elevated legs while holding a big exercise ball; navy rope - movement of the rope alternately with both hands upwards, downwards and in the shape of an eighth; box jumps with a height of 30-60 cm.

During the third and the fourth week, three rounds were made at each station, with a duration of 30 seconds, and a break between the stations of 90 seconds. The following exercises were carried out at the stations: lifting a Russian kettlebell of 10 kg, from a standing position with two hands in front of the head; skip in place under the pressure of an elastic rope with a length of 5 meters; lifting a Russian kettlebell of 8 kg, from a base above the head with one hand; repetition of a push-up and then a high jump under load with an elastic strap; striking a medicine ball of 10 kg with two hands from the base; bands on a hanging bar; lifting the legs attached to a TRX strip from the position of a push-up towards the chest; kicking a tractor tire with a 12 kg hammer; towing in a sprint of a sledge with a weight of 40 kg at a distance of 30 meters; alternative stepping forward with the right and the left leg and twist to the left and right with a medicine ball of 10 kg in a hand.

During the fifth and the sixth week, three rounds were performed at each station, with a duration of 40 seconds per station, and a break of 90 seconds between the stations. The following exercises were carried out at the stations: kneeling with a kettle bell of 10 kg; bench jump with a height of 80 cm and with a vest of 20 kg, twist with a medicine ball of 10 kg in a sitting position with half-twisted legs; push-up hold with the legs leaned on an exercise ball, alternate pulling of the knees towards the chest and backwards; sprint at 5 meters with touching a cone in different directions under the load of a 5-meter long elastic strap; jumps with two legs over obstacles with a height of 80 cm; wall bars folds; side strike from a wall of a medicine ball with a weight of 10 kg; pulling an elastic rope backwards with an alternate stepping with the left and the right leg; push-up hold of an exercise ball, knee to chest stretch, inward twist and rotation of the hips and side leg stretch.

Statistical Analyses

After a test for the normality of distribution, data were expressed as the mean ±SD. The univariate differences in the analyzed variables, between the initial and the final measurement were tested with T-tests for small dependent samples. A probability level of 0.05 or less was taken to indicate statistical significance. All data were analyzed using the Statistical Package for the Social Sciences (SPSS) (SPSS Inc., Chicago, IL, USA, version 22.0).

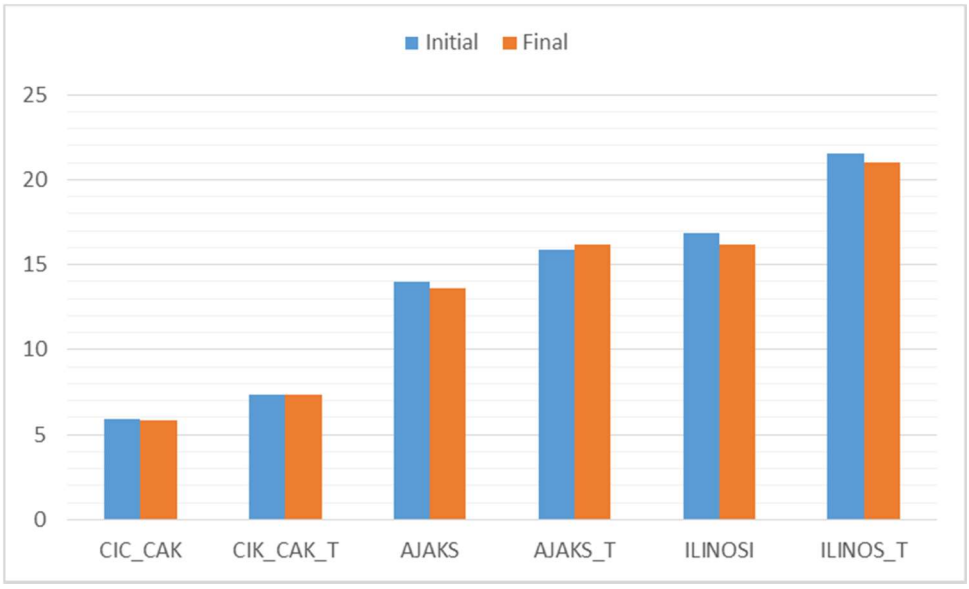
Results

Aiming to establish the changes in the specific-motoric tests after the conducted six-week training treatment, a univariate stage of testing (T-test of dependent samples) was applied. The t-test results of the examined respondent groups are presented in Table 1 and Graphic 1.

Basing on the values of T-tests, the numeric values of arithmetic means and rated differences, it can be concluded that the experimental treatment of the entire respondent sample resulted into significant effects. The results presented in Table 1 show that with regard to the entire sample of respondents, statistically significant differences between the initial and final measuring in the following specific-motoric tests have been established: zigzag running without a ball, Ajax test without a ball, Ajax test with a ball, Illinois test without a ball and Illinois test with a ball. Statistically significant differences were not established only in the specific-motoric test of zigzag running with a ball.

Table 1. Differences in the initial and final measuring of specific-motoric tests with the entire sample of respondents

	Initial		Final		r	%	t	df	Sig
	Mean	SD	Mean	SD					
CIC_CAK	5,91	0,40	5,87	0,35	0,97	-0,7	2,64	41,00	**0,012**
CIK_CAK_T	7,31	0,41	7,31	0,41	1,00	0,0	-0,87	41,00	0,390
AJAKS	14,01	0,64	13,60	0,55	0,67	-2,9	4,90	33,00	**0,000**
AJAKS_T	15,88	0,50	16,18	0,55	0,66	1,9	-4,02	33,00	**0,000**
ILINOIS	16,85	0,89	16,21	0,55	0,60	-3,8	5,26	33,00	**0,000**
ILINOIS_T	21,52	1,27	21,01	1,77	0,59	-2,4	2,05	33,00	**0,048**



Graph 1. Differences between the initial and final measuring within the specific-motoric tests of the entire sample of respondents

Discussion

The former researches indicate that the specific motoric abilities can influence the selection of athletes in many sports (Hasan et al., 2007). In order to be successful in a given sports discipline, it is very important for the athlete to have a proper morphologic-functional profile (Ziv and Lidor, 2009). The contemporary

football trend has the focus mainly on improving the performances of all the athletes playing all positions, which is supposed to enable a greater movement of the strikers and midfielders.
The selection and profiling of talented athletes is important in sports that require high performances. Therefore, in selecting talents there should be used objective criteria, norms and standards based on anthropometric, motoric, specific motoric and physiologic indexes. Further, proper guidelines based on the individual differences in the growth and development of the functional and motoric abilities should be provided. (Orhan et al., 2013).

Fast and often changes in the movement direction is a quite repetitive characteristic of the modern football. Presently, among the sports scientists, there is no consensus about the precise definition on agility (Shepard and Young, 2006). Earlier, the agility was described as an ability of quick change of the body direction, combined with speed, strength, balance and coordination (Draper and Lancaster, 1985). Performances of agility are not closely connected with the direct components of speed (Butifant et al., 1999). As an example of the standard tests in agility assessing is the Illinois test (Cureton, 1951). The authors stuck to the opinion that the agility tests should be independent of the maximum speed and have more correlation with the acceleration, since it is connected with the requirements in changing direction and the re-acceleration. It is pointed that the agility tests distinguish the elite football players from the general population much more than any other test of strength, power or flexibility (Raily et al., 2000); but today there are no "golden standards" of assessing the same. Nevertheless, this ability is regarded as a particularly important component of the physiological assessment in football (Svenson and Drust., 2005). During a contest, the football player performs in average 1.000 to 1.4000 changes of direction. The direction change happens in every 4-6 seconds.

The research results show that the experimental treatment of the entire respondent sample has a statistically significant positive change of the average arithmetic volume of the respondents' achievements in performing the specific motoric tests of CIK_CAK with the improvement rate of 0,7%, AJAKS with the improvement rate of 2,9%, ILINOIS with the improvement rate of 3,8%, ILINOIS_T – of 2,4%.

Statistically significant changes in negative direction are present with the size of the arithmetic mean in the respondents' achievements of AJAKS_T performance with the decrease rate of 1,9%.

The research conducted by Brahim, Bougatfa and Mohamed (2013) points that the midfielders show the best results in agility, which corresponds with the present research results. According to Boone, Vaeyens, Steyaert, Vanden Bossche and Bourgois (2012), the strikers were considerably faster than the goalkeepers, defenders and midfielders. Taskin (2008) established similar results in agility between the athletes playing different positions in the team. Gil et al (2007) examined abilities of young football players aged 14-21. The research results pointed that the strikers show the best agility.

Despite certain limitations, the research can serve as an inspiration for conditional and sports coaches in football teams to recognize and eliminate the weaknesses of their players, especially in the conditional training in the preparation period and individual training with regard to the results obtained from the diagnostics during the entire year-round series of training. Coaches need to have good knowledge about the general and specific tasks that the player has to perform in the game. It is strictly recommended about certain positions in football to be selected players who, with their morphofunctional characteristics, are as much as possible compatible with the requirements of the position they play. The presented data can also serve as some norms and standards of top football players from the point of view of researching the movement abilities.

Conclusions

On the bases of the obtained results, there can be concluded that the six-week experimental training program of adapted football functional training has a positive effect in improving the average results in four out of six specific motoric tests. On the basis of the numeric values of arithmetic means and rate differences, there can be concluded that within the period of six weeks there was an improvement in the entire respondent sample with regard to the following tests: specific motoric tests CIC_CAK with 0,7%, AJAKS with 2,9%, ILINOSI with 3,8%, ILINOS_T with 2,4%. Statistically significant changes in negative direction are present with the size of the arithmetic mean in the respondents' achievements of AJAKS_T performance with the decrease rate of 1,9%. Statistically significant differences between the initial and final measurement is not established only with the specific motor test of zigzag running with a ball. The results of the research are a valuable material for scientists along with coaches, experts, as well as football analysts. Having in mind that football is one of the most popular sport worldwide, the growth and development of

the players needs to be monitored. In selecting talented players there should be implemented tests of assessing the physiologic and motoric as well as the specific motoric performances, together with the anthropometric and somatotype researches.

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