THE INFLUENCE OF THE SPECIFIC 3-MONTH FOOTBALL PROGRAM ON THE STRENGTH AND FUNCTIONAL ABILITY OF FOOTBALL PLAYERS AGED 16 – 18

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Abstract: The main goal of this research is to determine the level of quantitative changes in motor and functional abilities in the three-month football program of football players aged 16-18. Based on the aim of the research, the basic tasks were determined, i.e. to perform the initial measurement of motor and functional abilities for each respondent individually at the beginning of the program, to conduct a training program lasting 3 months, to perform the final measurement of motor and functional abilities of each respondent individually at the end of the program, choose an adequate procedure for data processing, draw conclusions based on the obtained data. The respondents were members of the football club FK Blagaj from Blagaj. The longitudinal research included 30 respondants of FK Blagaj aged 16-18 years. The work program lasted 90 days, with a total of 38 training units. Training was conducted three times a week. The duration of the training ranged from 50 to 60 minutes, depending on the training task, period, weekly and daily work schedule, weather conditions and ambience.

Keywords: football, experimental program, functional abilities, strength

INTRODUCION

The main goal of this research is to determine the level of quantitative changes in motor and function-al abilities in the three-month football program of football players aged 16-18. Based on the aim of the research, the basic tasks were determined, i.e. to perform the initial measurement of motor and functional abilities for each respondent individually at the beginning of the program, to conduct a training program lasting 3 months, to perform the final measurement of motor and functional abilities of each respondent individually at the end of the program, choose an adequate procedure for data processing, draw conclusions based on the obtained data. The respondents were members of the football club FK Blagaj from Blagaj. The longitudinal research included 30 respondants of FK Blagaj aged 16-18 years. The work program lasted 90 days, with a total of 38 training units. Training was conducted three times a week. The duration of the training ranged from 50 to 60 minutes, depend-ing on the training task, period, weekly and daily work schedule, weather conditions and ambience. Methods, content and intensity of work are harmo-nized with the developmental characteristics of the respondents. These results give us the right to claim that the work program with the entirely appli-cation of the situational model of work, based on exercises of strength and functional abilities, and adapted to the age characteristics of the youngest football players, leads to positive changes in most situational-motor and functional abilities. All this confirms that the skillful manipulation of volume, intensity and rest between repetitions and series of exercises, which can be very well controlled by appropriate selection of exercises and specific assignments in the game, depending on the period of preparation, it is possible to make a high-quality training that will be integrated and at the same time different fitness and technical-tactical require-ments.

METHODS

This study is a longitudinal character (which means that we researched out between the two time points, finding the first initial state subjects, then conducted the program and ultimately determine their final status), and aims to determine the level of quantitative-qualitative changes in motor and functional abilities in a three-month football program.

Sample of respondents

The respondents were members of the football club FK Blagaj from Blagaj. The longitudinal research included 30 FK Blagaj respondents aged 16-18.

Sample variables

The project defined the following variables that will cover motor characteristics that influence the success in the football game (Šoše, Mekić i Rađo, 1998; Čolakhodžić, 2010; Čolakhodžić, Rađo, 2011):

Variables for estimating motor ability:

1. High jump (explosive power) (MFESVM)
2. Bench press (static power) (MRABPT)
3. Lifting the torso from lying down (repetitive power) (MRSDTŠ)
4. Long jump from place (explosive power) (MFESDM)

Variables for estimating functional ability:

1. Cooper test (FAE12)
2. Harvard step test (HST)

Research description

Spatial, temporal and organizational conditions are provided in accordance with the standards for such research. Measurements were carried out in the forenoon at the stadium of the FK Blagaj in Blagaj, whose space met the standards for measurement (world temperature, temperature, etc.), under equal measurement conditions for all respondents, which is why each measurement test is the same on true respondents. The weigher first read the result, the scorer would repeat it and write it in the personal card of the respondent as measured, i.e. in the original units of measurement for each motor measuring instrument. Respondents came for measurement in groups of 10 respondents. Re-spondents came for measurement in groups of 10 respondents. They performed each test in appropriate clothing and footwear (T-shirt, shorts and sneakers). When programming the experiment, the order of the measuring instruments was taken into account, in order to avoid the influence of the application of one test on the results of another. According to the experimental scheme, the order of measurements was the same for all subjects. Measurements to assess motor ability of power were performed in sequence:

1.High jump,

2.Long jump,

3.Lifting the torso from lying to sitting,

4.Bench press,

After measuring the motor ability of strength, the measurement of functional abilities was started, namely the Cooper test.

Chronologically, all subjects completed the meas-urement on the same measuring instrument. Re-spondents were explained what awaits them during testing, and are reasonably motivated to commit to each test and measurement. For the regularity and uninterrupted execution of this program, all re-spondents participating in the examination were subjected to measurements under the same condi-tions, and the work was approached with maximum seriousness and commitment.

Data processing methods

In relation to the subject, problem, objectives and hypothesis of the study as well as the characteris-tics of the collected data, and the possibility of their statistical analysis, methods for processing data were selected and applied. The basic methods for processing the results are determined by the char-acteristics and size of the sample and the research hypothesis. We used appropriate mathematical-statistical methods and procedures for data entry, data processing and analysis. Processing of the results was performed in the program SPSS 19.0 for Windows.

For each applied variable, the central and disper-sion parameters were calculated:

- Arithmetic mean (mean)
- Standard deviation (Std.Dev.)
- Minimum value (Minimum)
- Maximum value (Maximum)

The normality of the distribution of test results is based on these measures:

- Coefficient of curvature (Skewness)
- Coefficient of association (Kurtosis)

Using a univariate t-test for dependent samples, the difference of the applied variables before and after the football program was tested.

RESULTS AND DISCUSSION

Based on the results obtained from the program for 90 days, it led to statistically significant changes in all of the treated variables for the evaluation of functional abilities and strength. The program really showed slight changes in the stated duration of the program, in all segments of playing potential, which gives us practical applicability, and a suggestion to all coaches to apply a similar way of working, especially in this system where weight and strength of youth development is slightly neglected. The basis of the training was to increase all the performances by which the young man achieves the path to com-pleting the entire playing potential, accompanied by technical and tactical work.

Besides a lot of research on this subject, it did not stop us from introducing a novelty in terms of the diversity of the training program being researched, because in modern football, more and more, the basic factor is the enhance of these performances.

Habul, Čolakhodžić, Ademović (2012) found that the boys, who are in the system football training, have higher values of the variables that define the pul-monary ventilation and have more continuous trend of growth and development up to 15 years, after which we can claim with certainty that this training program can be extremely complex in the transition period between the two generations, which is a key problem in all clubs when taking over generations from different coaches, of course with certain cor-rections and tracking of professional staff.

Based on the results, where the form of players and their general progress was observed in all charac-teristics, we can conclude that this increase took place due to the change of generation and a sud-den change of training program, i.e., the transition from cadet to junior generation.

Under the influence of a stronger training program, adequately dosed, and the first encounter with adequate nutrition causes sudden changes in a short period of work. After that with adequate work the general development of these generations can be monitored, which is the current problem in most clubs, except for a few most developed clubs that have an additional academy and an entire profes-sional team that monitors the entire development after selecting the most promising players.

From Table 1 we can't determine major changes, however, taking into account the fact that currently in practice the most difficult thing is to increase the body weight of players, with delay and improve-ment of motor and functional abilities, and taking into account the maximum weight of these re-spondents, we can determine that the program has shown successful in accordance with the stated tasks.

We can also conclude that the minimum weight before the program was 55.9, while after the pro-gram it increased to 58.1, and the maximum 92.9, which after the program decreased to 87.2. This means that the program showed exactly the basic goal in which we satisfied both groups, increasing the mass for those who need it, and reducing it for those who need it.

Table 1.- Descriptive indicators of measurement results for body weight

	N	Extent	Min.	Max.	A.S.	Std. Dev.	Var.	Ske.	Kur.
Weight initial (kg)	30	37.0	55.9	92.9	73.220	8.2349	67.813	.392	.936
Weight final (kg)	25	29.1	58.1	87.2	74.684	6.6664	44.441	-.180	.453

A jump, or reflection, is one of the more important elements of the manifestation of strength in a football game. Development requires a longer period with retention of all other components. From Table 2, we conclude that the average increase in high jump is 3,260 cm, which is not an extreme increase.

Nevertheless, as part of the program, we can determine that it is important to choose specific training units with which we can improve each segment of the football game.

Table 2. - Measurement results for estimating the MFESVM variable

	N	Extent	Min.	Max.	A.S.	Std. Dev.	Var.	Ske.	Kur.
High jump from a place initial (cm)	30	23.0	25.0	48.0	37.100	5.5792	31.128	-.038	-.496
High jump from a place final (cm)	25	20.0	29.0	49.0	40.360	4.8380	23.407	-.484	.039

Long jump and high jump are related variables for rating the motor ability of strength, from which we can conclude in which segment and phase is the development of sports potential. The results show us an increase of 26.971% from the initial state, which is impressive. With probabil-ity we claim that the sudden increase occurred after the transition between the two generations and the change of coach and training program.

Table 3. Measurement results for estimating variable MFESDM

	N	Extent	Min.	Max.	A.S.	Std. Dev.	Var.	Ske.	Kur.
Long jump from a place initial (cm)	30	45.1	225.4	270.5	244.450	10.4095	108.35	.322	.166
Long jump from a place final (cm)	25	34.5	240.0	274.5	252.352	9.1597	83.90	.527	-.370

Cooper test, one of the basic tests for rating func-tional abilities, which is less and less used, but which does not mean that it is not relevant, and we are witnessing that more and more football staff do not meet the stated conditions. From the results we conclude that none of the young people reached the grade 5, i.e.to cross 3200 m in 12 minutes, which is not surprising,

due to the current passivity of the training staff in the development of function-al abilities.

The increase after the program does not have to be directly related to the impact of the program, but the possible decline in form before the program, caused a slight increase in arithmetic means of 81.1, which in any context we can't take into ac-count.

Table 4. - Cooper test result

	N	Extent	Min.	Max.	A.S.	Std. Dev.	Var.	Ske.	Kur.
Cooper test initial	30	1150.0	1950.0	3100.0	2444.500	258.9113	67035.086	.032	.754
Cooper test final	25	980.0	2110.0	3090.0	2525.600	209.1467	43742.333	.674	1.328

The bench press is one of the most popular exer-cises for young people, which they use for the wrong purposes. The development of strength in the upper torso is one of the key elements for the development of complete strength during sprints, duels and deflections.

The increase of 14.754% after the program from the initial measurement and the difference of 9 kg, may represent the initial development, when not encountering this exercise, which is in any case a great progress and a very significant difference, in a complete overview of changes in all variables, tak-ing in consideration and development of functional abilities.

Table 5. - A variable for estimating motor ability of power MRABP

	N	Extent	Min.	Max.	A.S.	Std. Dev.	Var.	Ske.	Kur.
Bench press initial (kg)	30	47.5	42.5	90.0	61.083	10.5390	111.070	.817	.924
Bench press final(kg)	25	42.5	50.0	92.5	70.088	12.3763	153.173	.213	-.733

From Table 5 we conclude that the minimum num-ber of lifting the torso in the first measurement was 8 repetitions, which can be related to the weight of the subjects, which decreased over time, to in-crease the minimum number of repetitions of lifting the torso in the seat. The minimum number of rep-etitions doubled, while the maximum number of repetitions increased slightly by 3 repetitions to 51, which we associate with one of the trained youths.

Lifting the torso from a supine position is one of the exercises through which the force of the ball's im-pact, jump and partial acceleration are manifested.

Table 6. - Measurement results for the variable MRSDTŠ

	N	Extent	Min.	Max.	A.S.	Std. Dev.	Var.	Ske.	Kur.
Lifting the torso from a supine position initial (repetition)	30	40	8	48	24.800	10.0499	111.070	.322	.166
Lifting the torso from a supine position final (repetition)	25	36	16	51	30.640	8.5337	153.173	.527	-.370

The results of research into the effects of specially programmed exercise on the development of functional abilities and strength will primarily contribute to better methodological design of teaching and training work, which will provide more efficient mon-itoring and evaluation of quantitative changes in anthropological characteristics of morphological characteristics, motor, functional and situational motor abilities.

Table 7. -Descriptive indicators of paired samples

		Mean	N	Std. Dev.	Std. Error Mean
Pair 1	Weight of respondents before the program	74.548	25	7.8918	1.5784
	Weight of respondents after the program	74.684	25	6.6664	1.3333
Pair 2	High jump from a place before the program	37.760	25	5.5474	1.1095
	High jump from a place after the program	40.360	25	4.8380	.9676
Pair 3	Long jump from the place before the program	246.144	25	9.3113	1.8623
	Long jump from the place after the program	252.352	25	9.1597	1.8319
Pair 4	Cooper test before the program	2480.400	25	253.1877	50.6375
	Cooper test after the program	2525.600	25	209.1467	41.8293
Pair 5	Bench press before the program	61.800	25	10.7897	2.1579
	Bench press after the program	70.088	25	12.3763	2.4753
Pair 6	Lifting the torso from a supine position to sitting before the program	24.800	25	10.0499	2.0100
	Lifting the torso from a supine position to sitting after the program	30.640	25	8.5337	1.7067

Table 7. -Analysis of differences in arithmetic means of variables for evaluating some anthropological features

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	(Sig. 2-tailed)
				Lower	Upper			
Weight of respondents before and after the program	-.1360	2.2368	.4474	-1.0593	.7873	-.304	24	.764
High jump before and after the program	-2.6000	3.3417	.6683	-3.9794	-1.2206	-3.890	24	.001
Long jump before and after the program	-6.2080	6.3055	1.2611	-8.8108	-3.6052	-4.923	24	.000
Cooper test before and after the program	-45.2000	98.4937	19.6987	-85.8562	-4.5438	-2.295	24	.031
Bench press before and after the program	-8.2880	5.7737	1.1547	-10.6713	-5.9047	-7.177	24	.000
Lifting the torso from a supine position to sitting before and after the program	-5.8400	3.6819	.7364	-7.3598	-4.3202	-7.931	24	.000

It is a known fact that athletes of different age categories differ in personal, abilities and knowledge. These are indicators of training in general, but in particular the differences between groups of athletes in the indicators of individual anthropological characteristics can be determined. A particularly important part of the research so far relates to the obtained data on the morphological characteristics of top footballers, but in this re-search, we showed how to make a general program with a general goal and complete impact on the entire playing staff, which we were able to show. These results tell us about the program that showed one of the adequate training systems be-tween the two generations, which in this period of development of the football in Bosnia and Herze-govina, is very necessary. We have already estab-lished the problem of transition from one genera-tion to another, with the change of coaches, differ-ences in work methodology, lack of adequate strength training and development of functional abilities.

CONCLUSION

Football game is a complex sports activity charac-terized by a high variability of motor activities with or without the ball by which the game is realized and by which players achieve the basic goals of the game in defense, transition and attack: taking the ball away from the opponent, organizing and im-plementing tactical action, scoring a goal and achieving the final victory in the match. The activity in the football game also has its specifics with con-sideration to the intensity and duration of work. According to Bangsbo 1991, very high development of physical abilities is required: optimal physique, development of aerobic and anaerobic system, high degree of muscle strength, highly developed speed and agility, optimal flexibility and balance.

These results give us the right to claim that the work program with the exclusive application of the situational model of work, based on exercises of strength and functional abilities, and adapted to the age characteristics of the youngest football players, leads to positive changes in most situational-motor and functional abilities. All this confirms that by skillful manipulation of the volume, intensity and pause between repetitions and series of exercises, which can be very well controlled by adequate selection of exercises and certain tasks in the game depending on the period of preparation. It is possi-ble to make an extremely high-quality training in which different fitness conditions (depending on the preparation period and the goal of the training) and technical-tactical requirements will be integrated at the same time.

Considering all the issues and results of this research, we are of the opinion that the applied program can be used in practical training work. With slight corrections of the program, i.e., paying more attention to precision as a motor skill, where young footballers will be brought into situational conditions to solve various specific tasks of precision, with an appropriate relationship with the technique and tactics of football game, we assume that it is pos-sible to raise the motor ability of precision to a higher level.

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